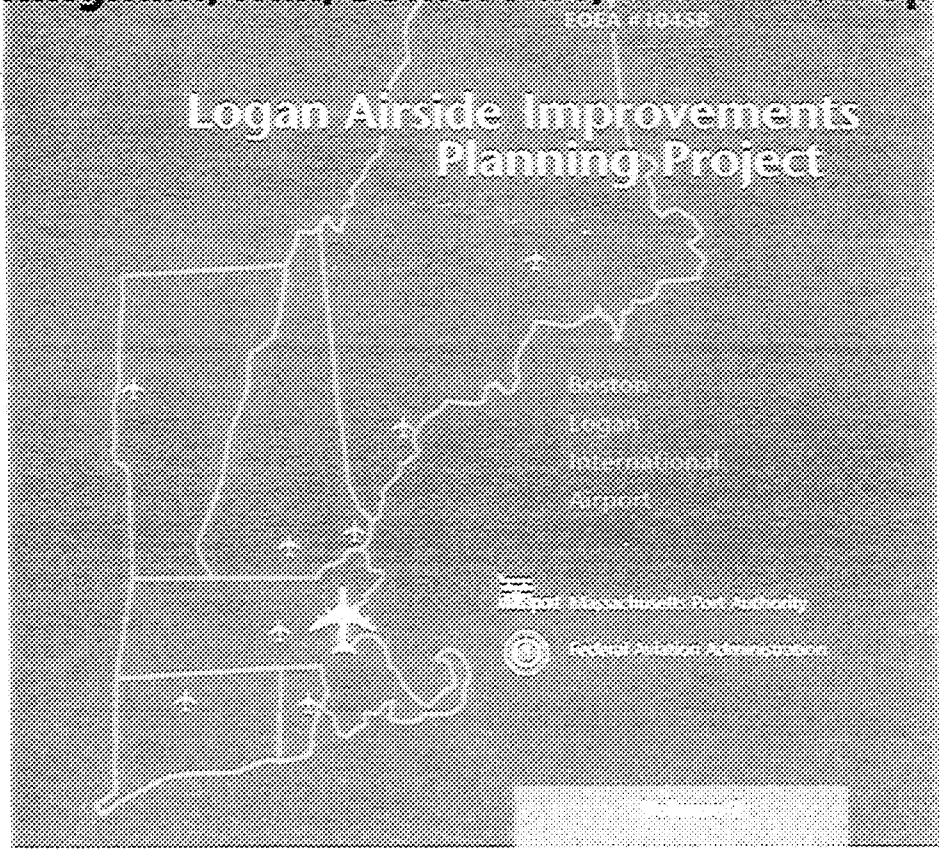
Letter 17

Errors and Omissions

Massport's flawed SDEIS/FEIR

Consolidated comments: Cohasset, Everett Hingham, Hull, Somerville, and Winthrop



Failure to provide complete and accurate disclosure of material facts necessary for adequate review.

Use of false and deceptive information.

Inadequate analysis of noise impacts, emissions, and delay.

Refusal to implement peak period pricing first.

Refusal to consider appropriate proposed mitigations.

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June 6, 2001

Secretary of Environmental Affairs
Attention: MEPA Office
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Mr. John C. Silva
Manager, Environmental Programs
Airports Division, ANE-600
New England Region
12 New England Executive Park
Burlington, MA 01803

Re: Proposed Logan Airside Improvements Planning Project
Final EIR (EOEA No. 10458)
Supplemental Draft EIS

Dear Mr. Pugsley and Mr. Silva:

The enclosed documents serve as comments submitted on behalf of the Towns of Cohasset, Hingham, Hull, Winthrop, and the Cities of Somerville, and Everett in opposition to the above referenced project.

These comments specifically pertain to the SDEIS/FEIR and the inadequacies that we have found within the document. For the reasons discussed in the attached documents, the Towns of Cohasset, Hingham , Hull and Winthrop and the cities of Somerville and Everett urge the Secretary of Environmental Affairs, Robert Durand, and the Administrator of the FAA, Jane Garvey, to find the SDEIS/FEIR inadequate.

Thank you for the opportunity to submit comments and for your consideration of the matters discussed in the enclosed documents.

Respectfully submitted by:

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INTRODUCTION AND EXECUTIVE SUMMARY

Massport failed to include material facts, concealed material facts and presented misleading and deceptive information in violation of MEPA and NEPA legal requirements.

Accurate and comprehensive disclosure of all material facts is the most basic and fundamental requirement of the MEPA/NEPA environmental review process. The entire statutory and regulatory scheme of MEPA/NEPA depends on such full and complete disclosure. Consequently, the failure of a Proponent to abide in good faith with this basic principle of transparency, is the most serious violation of all MEPA/NEPA legal requirements because it directly undermines the procedural and substantive goals of both federal and state statutes.

The procedural goal of these laws is to ensure that projects with significant environmental impact are reviewed and analyzed in the context of an "environmental democracy" where regulatory officials, elected officials and members of the general public are given a meaningful opportunity to conduct an independent, objective review of the short-term, long-term and cumulative environmental impacts of the project. It is impossible to realize the procedural goal of MEPA/NEPA without accurate and comprehensive factual disclosure. If material facts are not included or are concealed and if the facts which are presented are misleading and deceptive, there is no opportunity for regulatory and elected officials or a member of the general public to use the process to accurately determine the short-term, long-term and cumulative impacts of a project. In such a case the procedural requirements are violated, and contrary to the express directive of our political democracy, our citizens are deprived of an environmental democracy.

Likewise, without full and accurate disclosure, it is impossible to meet the MEPA/NEPA substantive standard for environmental protection. This standard is intended to ensure that all federal, state, regional and municipal governmental agencies use all feasible means to avoid damage to the environment or, to the extent damage to the environment cannot be avoided, to minimize and mitigate damage to the environment to the maximum extent practicable. If the Proponents engaged in the MEPA/NEPA process fail to disclose material facts or file misleading, deceptive or false information, there is no accurate factual basis for such evaluation and analysis, and the substantive purpose of both federal and state statutes is negated.

When NEPA was enacted in 1969, it was intended to be the foundation for all future federal environmental legislation. In 1972, when MEPA was enacted, the Commonwealth of Massachusetts chose not to rely solely on the federal act, but to guarantee with its own state law that the principles of good faith factual disclosure would enable the citizens of

the Commonwealth, as well as their elected and appointed officials, to act in the best interests of environmental protection.

As detailed below, Massport has violated the statutory and regulatory requirements of the MEPA/NEPA environmental review proceedings, by withholding facts which are material to the proposed Project and by submitting information during the MEPA/NEPA process which is misleading, deceptive or false. This unlawful action by Massport must be considered a fundamental and fatal inadequacy in their SDEIS/ FEIR, since it prohibits any meaningful opportunity for objective review of the short-term, long-term or cumulative impacts of their proposed project.

In order to comment on the SDEIS/ FEIR, the municipalities represented herein have retained the services of noise, aviation, air emissions, delay, peak pricing and regional planning experts. Each of these experts has reported that Massport's MEPA/NEPA filings lack the basic material facts necessary for an informed evaluation and review. All of the experts have criticized Massport's ENF, DEIS/R and SDEIS/ FEIR for failing to include any consistent factual baseline, and for presenting data, analysis and conclusions in a manner that is deceptive, misleading and false.

In summary, as detailed below, Massport appears to have knowingly, in bad faith and in violation of federal and state law, withheld or otherwise concealed material facts and submitted false information during the MEPA/NEPA review process. Such an egregious affront to the authority and dignity of our laws should not and cannot be tolerated. Only by finding the SDEIS/ FEIR inadequate and by requiring Massport to repeat the MEPA/NEPA review process, can the Secretary and the Administrator uphold the public trust and the responsibilities invested in them by state and federal laws.

The SDEIS/FEIR is Inadequate.

The SDEIS/FEIR is inadequate for the following reasons:

Runway 14/32

- Massport has failed to provide any airspace design or analysis which would delineate how aircraft would land and take off from Runway 14/32 and other operating Runways at Logan when Runway 14/32 is in use. Without such design and analysis it is impossible to determine where aircraft would fly or how frequently they could take off or land, and therefore, it is impossible to determine delay reduction benefits, noise impacts or air emissions. 17.1

- Massport has failed, contrary to the requirements of 301 CMR 11.07(6)(e)(3), to provide adequate coordinates for the location of Runway 14/32 (See Figure 1.1). Since the orientation of Runway 14/32 could vary in orientation by up to 17.2

8 degrees, these coordinates are necessary to determine the airspace design and environmental impacts of Runway 14/32.

- Massport has failed to present the location and description of what navigational aids will be used for landings and takeoffs on Runway 14/32. Without such information it is impossible to determine where the actual flight paths and impacts of those aircraft which utilize Runway 14/32. 17.3

- Massport has failed to disclose how fixed wing aircraft can land on Runway 14/32 based on the approach which is set forth in Figure 5.2-2 on page 5-17 of the SDEIS/FEIR, when such an off center approach can only be used today by helicopters. 17.4

- Massport has failed to disclose minimum landing requirements for regional jets as set forth in airline specific operating manuals. 17.5

Fleet Mix

- Massport has failed to disclose how it determined in its 37.5M High RJ fleet mix that regional jets will replace 747s and reduce scheduled flights of 747s in 2015 from 20 to 2 per day. 17.6

- Massport has failed to disclose that 75% of its 1999 scheduled regional jet flights were CRJ-200, which will not use a 5000-foot runway. 17.7

- Massport has failed to disclose the increased number of regional jets and the decreased number of turboprop aircraft for any benchmark other than its 37.5M High fleet mix. 17.8

Air Emissions

- Massport has failed to disclose an air emissions inventory or air quality analysis for the Preferred Alternative. 17.9

- Massport has presented false air emissions comparisons between the Preferred Alternative and the No Build Alternative.

- Massport has underestimated air emissions inventories by as much as 150%. 17.10

- Massport has failed to include a SIP conformity determination, even though Logan is a major source of NOx in an Air Quality Control Region which has been designated a serious ozone nonattainment area and new, more stringent ozone standards have been established. 17.11

- Massport has failed to disclose such material facts as actual PM-2.5 monitoring data and project related PM-2.5 emissions even though more 17.12

stringent standards have been established as recently upheld by the United States Supreme Court.

- Massport has failed to disclose air emissions impacts on Long-Range Transport and Class I Areas. 17.13

- Massport has failed to disclose HAP emissions. 17.14

Noise

- Massport has failed to establish a consistent factual baseline for calculating noise impacts, using different years for different calculations in order to underestimate noise impacts. 17.15

- Massport has failed to use actual monitoring data from 1993 and 1999 to calibrate/validate the accuracy of its INM results, thereby underestimating actual noise impacts by up to 900%. 17.16

- Massport has failed to utilize actual radar tracks to validate projected flight paths, thereby underestimating noise impacts on the South Shore, Somerville, Everett, Winthrop and other communities. 17.17

- Massport has failed without any explanation to disclose monitoring data from 8 of its noise monitors. 17.18

- Massport has failed to disclose why its INM generated noise contours for landings are not aligned with radar flight tracks, existing navigational aides and existing and proposed runway orientations. 17.19

- Massport has failed to disclose noise impacts from aircraft at elevations over 1000 feet. 17.20

- Massport has failed to disclose noise impacts based on the 55 dB DNL metric as accepted by all agencies and boards, standard setting bodies and international organizations, with the exception of the Federal Aviation Administration and the Department of Defense. 17.21

Alternatives

- Massport has failed to consider the environmental benefits of immediate implementation of Peak-Period Pricing and the negative environmental impact of delay in Peak-Period Pricing until after the construction of Runway 14/32. 17.22

- Massport has failed to compare Alternatives I, II, and III to the No Build Alternative. 17.23

- Massport has failed to consider a No Growth Alternative. 17.24
- Massport has failed to compare Peak-Period Pricing to the Preferred Alternative based on a cost benefit analysis. 17.25
- Massport has failed to compare Peak-Period Pricing to the Preferred Alternative based on a scenario where Peak-Period Pricing was implemented without Runway 14/32. 17.26
- Massport has failed to consider, as an alternative, a regional multi-modal transportation system which decreases Logan passenger growth within the Route 495 beltway by improving passenger access to Manchester, T.F. Green, and Worcester airports. 17.27
- Massport has failed to consider new GPS/LAAS and GPS/WAAS technology as a delay-reduction alternative to Runway 14/32. 17.28
- Massport has failed to consider "push back restrictions" as a delay and pollution reduction alternative. 17.29

Preferential Runway Advisory System (PRAS)

- Massport has failed to determine how PRAS goals will be updated as defined, especially since new communities have been added to the CAC since the original adoption of PRAS. 17.30
- Massport has failed to provide detailed procedures and guidelines for how controllers will assign aircraft to runways under specific weather conditions in order to meet PRAS goals. 17.31
- Massport has failed to disclose the proportion of such operations assigned to each runway, the methodology by which this is done or the assumptions upon which such assignments are based. 17.32
- Massport has failed to disclose why PRAS has not been implemented to date and why future implementation efforts will be any more successful than its past failed implementation efforts. 17.33
- Massport has failed to disclose how it plans to meet MEPA/NEPA requirements implementing PRAS and when it plans to commence a MEPA/NEPA review on its plan to implement PRAS. 17.34
- Massport has failed to analyze or evaluate the short-term, long-term and cumulative environmental impacts of PRAS. 17.35

Delay

- Massport has failed to disclose the inner workings of its analytical models, FLAPS and DELAYSIM, making it impossible to understand, evaluate or otherwise validate the efficacy of these models. 17.36

- Massport has failed to disclose a concise description of the key assumptions made about capacity under the various configurations, how aircraft are assigned to operate on specific runways when these configurations are in use, and how the resultant delays, if any, have been estimated. Without such information it is impossible to determine how the specific delay estimates were prepared for the base case or any of the future scenarios developed by Massport. 17.37

- Massport has failed to disclose how projected delay-reduction will be affected if regional jets refuse to land on Runway 14/34. 17.38

- Massport has failed to disclose how projected delay-reduction will be affected by less than optimal conditions at Runway 14/34. 17.39

- Massport has failed to disclose the delay-reduction benefits which would result if Peak-Period Pricing was implemented first before construction of Runway 14/32. 17.40

- Massport has failed to disclose the delay-reduction benefits which new technology will make available in the near term. 17.41

Capacity

- Massport has failed to disclose its actual, sustained capacity. 17.42

- Massport has failed to disclose the impact of increased delays and congestion on future passenger growth, assuming falsely that, if no action was taken, historic growth rates for passengers would continue. 17.43

- Massport has failed to disclose the factual analysis and assumptions upon which it calculated that Logan has a capacity of 120 operations per hour. 17.44

- Massport has failed to disclose the actual increased capacity which it seeks to achieve through combined land and air improvements. 17.45

Project Change

There has been a Notice of Project Change for the following reasons:

- This comment constitutes a Notice of Project Change under 301 CMR 11.10(1).

- The Secretary may determine under 310 CMR 11.10(5) that there is a Notice of Project Change based on a determination that the Proponent has either knowingly or inadvertently concealed material facts and/or submitted false information during the MEPA review or that the Proponent has segmented the Project. 17.46

- The Proponent filed a Notice of Project Change based on lapse of time which included misleading, deceptive and false information and which it failed to circulate in accordance with 301 CMR 11.10(7).

- The changes in the Project and the lapse of time significantly increase the environmental consequences of the Project by reducing environmental and delay benefits due to change in fleet mix and by failing to demonstrate compliance with strict new ozone and particulate NAAQS even though the Project is now in a serious noncompliance area for these standards and the Proponent is identified in the SIP as a major source. 17.47

- The changes identified in the Notice of Project Change require the Notice to be published and comments to be received pursuant to 310 CMR 11.10(8) as to whether the Project warrants further MEPA review by submission of a new ENF, a Supplemental FEIR, or changes, additions or deletions to the scope. 17.48

Conclusion

The Supplemental DEIS/Final EIR is inadequate for the following reasons:

1. The SDEIS/FEIR is incomplete because the proposal has either failed to include or has concealed material facts.

2. The SDEIS/FEIR has included false, misleading and deceptive information.

3. The SDEIS/FEIR has failed to fulfill the requirements of 301 CMR 11.07(6) because there is no factual baseline and no comparative analysis.

4. The SDEIS/FEIR does not respond adequately to the EOEA Secretary's Certificate.

5. The SDEIS/FEIR does not respond adequately to the FAA Administrator's Certificate.

6. The SDEIS/FEIR does not respond adequately to the comments of federal and state agencies; federal, state and municipal elected officials; business and other organizations; and individual private citizens.

7. There has been a material change in the Project prior to the taking of all Agency actions for the Project, which significantly increases the environmental consequences of the Project.

8. The Proponent has segmented the Project.

For the above reasons, the Secretary of the EOEA and the Administrator of the FAA are required by MEPA and NEPA, respectively, to find the FEIR and SDEIS inadequate; or In the event that the Secretary finds that the Proponent has knowingly concealed a material fact or knowingly submitted false information during the MEPA review or the Secretary determines that there has been a Project Change, the Secretary should require the Proponent to repeat the entire MEPA review for the Project pursuant to 301 CMR 11.10(5-10).

I. IMPACTS

1. PREFERRED ALTERNATIVE-RUNWAY 14/32

A. Massport's SDEIS/FEIR analysis of environmental impacts and delay-reduction are inadequate because regional jets will not utilize Runway 14/32.

Massport's analysis of the use and benefits of Proposed Runway 14/32 is inadequate. Proposed Runway 14/32 is too short to be used by most scheduled regional jets' operations. Specifically, proposed Runway 14/32 is too short for commercial use by Canadair Regional Jets, which in 1999 made up over 75% of regional jet operations at Logan, and therefore will be used consistently only by general aviation operations.

In an effort to increase capacity at Logan, Massport has proposed the construction of Runway 14/32. Proposed Runway 14/32 is 5,000 feet in length, and its proposed location is at the southern edge of the airport, with a magnetic orientation that converges with Runways 33L and 33R. The proposed runway was designed to separate the flight operations of turboprops and other small aircraft from heavy and jumbo jets.[1] This runway will primarily be used when Runway 33L is the primary runway in use due to wind conditions.

As a result of the changing conditions of Logan's fleet mix, this runway is no longer a viable option to reduce delays at Logan. The current mix at Logan consists of approximately three turbo props out of every ten aircraft, and by the year 2004, is projected to be two out of every ten. Currently turboprops at Logan account for no more than 35% of the total aircraft mix, and this number is getting smaller. As regional jets continue to replace the turboprop fleet, the projected use of the proposed Runway 14/32 is dramatically reduced.

The current regional jet fleet at Logan is made up of three primary models: Canadair CRJ-200; Embraer 145; and Fairchild Dormier 328. According to the manufacturer's specifications as certified by the Federal Aviation Administration (FAA), the landing distance required for each model is 4,850 feet, 4,500 feet and 3,890 feet, respectively. With no explanation this would lead one to believe that the regional jet fleet could continuously use the proposed runway, however this is not true.

Certified landing distances are computed using the following factors:

[1] *Boston Logan International Airport: Airport Capacity Enhancement Plan* (October 1992); See Appendix A.

1. Zero wind. This assumes no head wind component for a slower ground speed on landing, thus resulting in a shorter landing distance. 17.49

2. Maximum landing weight of the aircraft. The lighter the aircraft, the slower the final approach reference speed.

3. Standard day conditions. This assumes that the atmospheric pressure is 1013.2 heeto Pascals (29.92 hg) with a temperature of 15 degrees Celsius (59 degrees Fahrenheit).

4. Dry runway. Runway contamination, such as water, ice, or snow increases the length necessary by 15%. (required for FAR 136 or 121 operations), thus further limiting regional jet operations.

Applying the 15% increase in length for non-dry runway conditions, the landing distance for Canadair CRJ-200 becomes 5,577 feet; for Embraer 145 becomes 5,175 feet; and for Fairchild 328 becomes 4,473 feet. Since the primary season for landing on the proposed runway is during the winter months, when stronger northwest winds prevail, the opportunity for contamination on the runway is great. Moreover, even under ideal conditions, most pilots will probably not use this runway to land regional jets, as has been demonstrated at Philadelphia and BWI.[2] 17.50

Takeoff distances must also be examined since it is projected that when the wind is from the southeast, this runway may be utilized for departures. Based on manufacturer provided data, the only regional jet that will be capable of departing the proposed runway 14 will be the Fairchild Domier 328 (standard day conditions). Since this runway will have primary use during warmer weather, temperatures greater than 15 degrees Celsius will be common. The computed takeoff distance required for this aircraft on a standard day is 4,535 feet. A temperature increase of 20 degrees Celsius will increase the takeoff distance to greater than 5,000 feet. Takeoff distances required for the remaining regional jets on a standard day are: 6,290 feet for the Canadair CRJ-200 and 6,519 feet for the Embraer 145. 17.51

[2] The SDEIS executive summary concludes by saying the "...the FAA evaluated the probable utilization of the runway by regional jet and found that the runway length would be acceptable for most regional jet types forecast to operate at Logan." The report apparently relied upon to suggest the foregoing was prepared by Jim Muldoon a consultant for the FAA. Although his report accurately depicts the take-off and landing parameters of a number of regional jet types, the report contains several critical assumptions to support use of this runway. As Mr. Muldoon points out these assumptions, including runway contamination, will seriously limit use of this runway by regional jets. Mr. Muldoon's report confirms the lack of significant regional jet use of the 5,000 foot runways at PHL and BWI, and suggests that CRJ pilots consider a 5000 foot runway too short for landings and takeoff, and either cannot or will not use a 5000 foot runway.

Pilot acceptance is also an issue with Proposed Runway 14/32. The ultimate authority for the use or non-use of this runway remains with the pilot, and pilot support for this runway is not enthusiastic due to the length. Interviews which our experts have conducted with regional jet pilots indicate that the preferred minimum runway length for these aircraft is 7,000 feet.

B. <u>Proposed Runway 14/32 will not reduce delays to the extent that Massport represents due to Air Traffic Control Restraints.</u>

There are several potential air traffic control constraints that have not been addressed in the Supplemental DEIS/Final EIR. Among the most significant are: 17.52

- No simultaneous precision approaches available at Logan;
- No proposed flight path design for Proposed Runway 14/32; and
- No Precision Runway Monitoring Equipment (PRM) in use at Logan.

At the present time, there are no simultaneous precision approaches available at Logan, thus, when precision approaches are required, Logan is restricted to a single-landing runway. If Runway 14/32 is built, this will not change. In short, if the weather is IMC requiring precision approaches, a single stream of traffic will be run to 33L only, offering no capacity increase at the airport. Runway 32 is not parallel to Runway 33, thus when the straight-in approach paths are extended, they cross (See Figure 1.1). Even if the two runways were parallel, 4,300 feet between runway centerlines is required for a true simultaneous IMC operation. This does not exist. Additionally, during IMC weather conditions, runway contaminants such as rain, snow or ice are likely to be present.

Proposed Runway 14/32 is intended to be used for departures on 14 and landings on 32, in a unidirectional manner. Significant planning must take place to optimize the use of this runway, if in fact it is built. There is no indication in the DEIS/R or Supplemental DEIS/Final EIR that such planning has occurred.

At the present time there is no PRM equipment in use at Logan. With this equipment aircraft separation standards may be compressed if approach procedures are designed to accommodate this type of operation. However, even if this equipment was installed and advanced navigation approach procedures were designed, the length of the proposed runway would still prohibit use by most regional jets.

The Secretary should find that Massport misrepresented material facts, and therefore should require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo its analysis of the proposed 5000-foot runway based on a preliminary air space design, and the true

and accurate fleet mix; and compelling Massport to examine and evaluate in depth the issues that prohibit the use of the current existing, substantially unused 5,000-foot runways in Philadelphia and Baltimore.

2. AIR EMISSIONS

Massport's treatment and analysis of air quality impacts as a result of the Preferred Alternative is inadequate. Massport has knowingly failed to present material facts and has presented false information. Specifically:

- Massport failed to provide and/or present any air quality analysis for the Preferred Alternative.
- Massport incorrectly based its claim that air emissions benefits will be attained with the construction of Proposed Runway 14/32 on theoretical mass-based air emission calculations and comparisons for two future emission scenarios.
- Massport detrimentally relies on its incorrect calculations and comparisons to claim that the proposed project is not regionally significant, not subject to federal conformity determinations, and is presumed to conform with State Implementation Plan (SIP) requirements.
- Massport arbitrarily cuts off emissions at 3,000 feet, thus omitting any adverse impact of emissions above 3,000 feet, which causes Massport to underestimate air emissions from Logan by up to 150%.
- Massport arbitrarily cuts off emissions at 3,000 feet, thus failing to take into account emissions that travel into a Class 1 Air quality Zone (i.e. Maine) and the effects it has in that area (i.e. visibility).
- Massport has failed to address how they will comply with Revised Ambient Air Quality Standards for ozone and PM-2.5.

A. <u>Massport failed to provide and/or present any air quality analysis for the Preferred Alternative.</u>

A thorough review of the Supplemental DEIS/Final EIR, the DEIS/R, the 1994/1995 Generic EIR and the March 1997 URS Emission Inventory Results indicates that Massport failed to complete an air quality analysis for the Preferred Alternative 1A. Moreover, what these documents do reveal is that Massport, in the Supplemental DEIS/Final EIR misrepresents both that such an analysis was performed and that as a result of such analysis "implementation of the Preferred Alternative would produce a reduction in emissions and an improvement in

ambient air quality compared to the No Action Alternative."[3] This is a clear fabrication and misrepresentation by Massport.

"The emission inventories developed for the year 2010/2015 and presented in the SDEIS/FEIR in Section 6.4-2 are based on the assumption of Peak Hour Pricing. The SDEIS/FEIR text does not indicate Peak Hour Pricing is assumed in the analysis. However, the emissions contained in SDEIS/FEIR Tables 6.4-4 through Table 6.4-8 contain the same emissions values as the March 1997 Tables for Alternative 1 (which is indicated on the Tables to reflect emissions for the Runway, Taxiway and Peak Hour Pricing)."[4] "Massport's Preferred Alternative 1A does not include Peak Hour Pricing (See Tables 1.2 and 1.2-1). Emissions without Peak Hour Pricing would be higher than those used in the SDEIS/FEIR. Therefore, the emissions differences between alternatives presented in this section of the SDEIS/FEIR cannot be determined based on the information presented. If, as it appears, the emissions estimates in Tables 6.4-4 through 6.4-8 are used in the dispersion modeling analysis, then the predicted impacts/concentrations also assume that Peak Hour Pricing is in place and the predicted impacts or concentrations on the SDEIS/FEIR for the construction of Runway 14/32 do not represent the Preferred Alternative as identified on Page 11 of the March 2001 Executive Summary (i.e. without Peak Hour Pricing)."[5]

The Secretary should find that Massport knowingly omitted material facts and knowingly submitted false information during the MEPA review process, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo its air quality emissions analysis using the Preferred Alternative 1A, not Alternative 1.

B. <u>Massport incorrectly based its claim that air emissions benefits will be attained with the construction of proposed Runway 14/32 on theoretical mass-based air emission calculations and comparisons for two future emission scenarios.</u>

"The main conclusion in the SDEIS/FEIR is that the 'Preferred Alternative' would result in an emissions reduction relative to the 'No Action Alternative'. This is based on the development and comparison of air emissions inventories (i.e., emissions of NOx, Nitrogen Oxides, Carbon monoxide, particulate matter and VOC's, Volatile Organic Compounds). Each alternative is assumed to be capable of handling 37.5 million annual passengers in 2010. The 'No Action

[3] Supplemental DEIS/Final EIR, Volume 1, page ES-24.
[4] Summary of Environ's Comments on SDEIS/FEIR Air Quality Analysis for Logan Runway Expansion; *See* Appendix B.
[5] Id.

Alternative' assumes that no changes will be made to the runway or existing plane configurations from the current Logan configuration. While the SDEIS/FEIR acknowledges that the current annual passenger demand is below 29 million passengers currently, the emissions calculations applied in the SDEIS/FEIR assume that the configuration will experience an increase in passenger throughput of 8.5 million passengers. This is the same passenger loading assumed for the Preferred Alternative, which includes a new runway. This is not a valid comparison for several reasons. First, improvements in actual ambient air quality can be only be demonstrated by comparing actual emissions and observed concentrations from the current time period to projected incremental impacts. The analysis presented in the SDEIS/FEIR compares a hypothetical future case (i.e., the Preferred Alternative) to another hypothetical future case (i.e., the No Action Alternative). This is an arbitrary analysis and the results could be different if the No Action Alternative was limited to the more likely case that a lower number of passengers could reasonably be expected to use the airport under the current configuration than under the Preferred Alternative. The baseline alternative, although a future case, also did not provide for other mitigating actions for the existing configurations that are not necessarily related to runway expansions, such as increases in the number of gates."[6]

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental EIR with an expanded scope compelling Massport to redo its air quality emissions analysis using the Preferred Alternative; compelling Massport to compare actual emissions and observed concentrations from the current time period to projected incremental impacts; and compelling Massport to set forth an actual baseline case.

C. Massport detrimentally relies on its incorrect calculations and comparisons to claim that the proposed project is not regionally significant, not subject to federal conformity determinations, and presumed to conform with SIP requirements.

"The SDEIS/FEIR indicates that the project's emissions do not require a conformity determination. These are required for federal actions that have increases in VOC or NOx emissions that are greater than 50 ton per year in a non-attainment area or transport region (40 CFR 93.153(b)(1)). Boston and Logan airport are located in both a non-attainment area for ozone and a transport region, and the increase in NOx emissions that are expected from future airport operations are greater than 50 tons per year. Therefore, not only is Massport's conclusion of non-applicability contrary to fact and regulations, but the projected increase in the "Preferred Alternative's" NOx emissions, from airport sources

[6] Id.

alone, from 1999 to 2010 is approximately 650 tons per year (see Table 6.4-5). The SDEIS/FEIR does not explicitly provide a basis for the non-applicability determination other than the comparison of two future alternatives. Furthermore, in order for emission reduction credits to be valid under State Implementation Plan (SIP) requirements, the emission reduction credits must be based on actual emission reductions. Anticipated or likely reductions due to future projections are not acceptable in meeting the reasonable further progress requirements for SIPs."[7]

Further, "the Massachusett's DEP considers Logan to be one of the largest NOx sources in the region. DEP also has formally acknowledged that the existing SIP for ozone will likely need modifications to provide for additional emissions reductions. Logan Airport is identified by DEP as one of the largest sources in the region, but one for which there are no required emissions reductions.[8] The SDEIS contains no further commitment from Massport to reduce emissions or to implement economically based incentives that could be employed to reduce emissions."[9]

D. <u>Massport arbitrarily cuts off emissions at 3,000 feet, thus omitting any adverse impacts of emissions above 3,000 feet, which causes Massport to underestimate air emissions from Logan by 150%.</u>

"Related to this issue, the SDEIS/FEIR indicates that this action is not regionally significant and the action "presumes" compliance with the SIP. These statements are not objectively supported by the information provided in the SDEIS/FEIR. Regionally significant is defined for federal actions in 40 CFR 93.152 as having an emissions potential of 10% or more for any non-attainment pollutant. The SDEIS/FEIR does not provide the details of the analysis used to indicate that this action is not regionally significant. However, the emissions inventory that is described in the SDEIS/FEIR indicates that emissions from airplanes are included up to a height of 3000 feet above the ground (See Page 6-96). This is an arbitrary assumption and is a default in the model that is used to calculate emissions. The meteorological information that is used in SIP modeling compliance analyses for Massachusetts simulates dispersion and ground level concentrations due to

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[7] Id.

[8] A letter dated April 22, 1999 from the DEP Northeast Regional Office to Secretary Bob Durand of the Executive Office of Environmental Affairs states "[a]irport and aircraft emissions represent the largest uncontrolled source of air pollution nationwide and in Massachusetts. In fact, aircraft emissions are the only mobile source of air pollution in the Massachusetts State Implementation Plan (SIP) emission inventory that have not been controlled or slated for near- or long-term emissions reductions." However, curiously the DEP in a letter to the EOEA from DEP, dated September 21, 1995 (DEIR Volume II Letter 2), DEP states, "I would like to take this opportunity to indicate that DEP fully supports the overall program of Airside and Landside Improvements at Logan Airport and will work closely with MEPA and Massport to assure that DEP permits for critical projects are expedited and will coordinate its actions with local, state and federal agencies to streamline the overall permitting process."

[9] Id.

emissions from the surface up to what is referred to as a mixing height. The mixing height data for afternoon mixing heights is frequently on the order of several thousand meters (2000m/6500feet) and can be higher in some situations. Therefore, the emissions inventories presented in the SDEIS are lower than would be expected if aircraft operations above 3000 feet were included in the development of air emissions inventories. The emissions above 3000 feet could increase aircraft emissions on the order of 150% more than Massport calculates.[10]

The Secretary should find that Massport omitted material facts, and therefore should require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental EIR with an expanded scope compelling Massport to redo its air quality emissions analysis using the Preferred Alternative 1A; and compelling Massport to analyze emissions at varying levels up to 6500 feet.

E. <u>Massport arbitrarily cuts off emissions at 3,000 feet, thus failing to take into account emissions that travel into a Class 1 Air Quality Zone and the effects it has in that area.</u>

Massport's air quality emissions analysis is inadequate. Massport, in the Supplemental DEIS/FEIR, failed to address whether or not implementation of the Preferred Alternative will have positive or negative impacts on Class 1 areas.

"The nature of airport emission sources, particularly aircraft, is that they emit pollutants at various altitudes throughout the air basin. The Logan expansion has the potential to impact – through long-range transport mechanisms – the air quality in downwind states and federally defined Class 1 areas designed to preserve pristine air quality levels. The airport emissions, including NOx emissions, have the potential to impact air quality related values (40 CFR 52.21), such as visibility, in these Class 1 areas. The Maine coastline has several Class 1 areas, defined in 40 CFR 81, that have experienced degradation of visibility from what is believed to be long-range transport from the northeast corridor."[11]

The Secretary should find that Massport omitted material facts in its analysis of the Preferred Alternative, and therefore should require Massport to file a new ENF. Alternatively, the Secretary should determine that the Supplemental DEIS/Final EIR is inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo its air quality emissions analysis for Preferred Alternative 1A; compelling Massport to analyze the positive and negative impacts, if any, of the Preferred Alternative on Class 1 areas; compelling Massport to propose a mitigation plan, if after a true and

[10] Id.
[11] Id.

accurate analysis of air quality impacts of the Preferred Alternative, it is determined that implementation of the Preferred Alternative will negatively impact Class 1 areas.

F. Massport failed to state how they will comply with the revised ambient air quality standards.

Massport's air quality analysis is inadequate. Massport failed to evaluate the implementation of the Preferred Alternative in light of the new, more stringent ozone standards.

"The SDEIS/FEIR acknowledges that the National Ambient Air Quality Standards (NAAQS) have been recently revised by the EPA for particulate matter and ozone. Specifically, the EPA revisions to the NAAQS were upheld by the Supreme Court in February of 2001. The result is that the ozone standard is now more stringent than the prior standard and there is a new standard that specifies acceptable ambient levels of PM with a diameter of 2.5 microns or less. The PM-2.5 NAAQS is targeted to respirable particulates that are small enough to avoid humans' natural air cleaning systems, enter the lungs and result in respiratory system problems."[12]

"The SDEIS/FEIR does not contain an evaluation of the project's PM 2.5 emissions or the baseline conditions that exist adjacent to the airport. Although it is a recent Supreme Court decision, the EPA promulgated the revised standards several years ago. The airport and the related sources could have an impact on the ambient air quality levels of PM-2.5. The SDEIS/FEIR states that 'the revised standards are not immediately subject to implementation....' This is a misleading statement. As with any other NAAQS, the EPA and states must develop a plan to measure ambient air PM-2.5 levels, evaluate attainment status for appropriate control regions and develop state implementation plans (SIPs). Therefore, the DEP will need to revise the existing ozone SIP and develop a PM-2.5 SIP. The SDEIS/FEIR does not evaluate the baseline conditions for the PM-2.5 NAAQS nor commit to any actual emission reductions from existing operations that will help bring the region into attainment with the ozone NAAQS."[13]

"The Massachusetts DEP has been collecting PM-2.5 data from four Boston locations since 1999. These data are publicly available, and identify several locations that are close to or exceed the PM-2.5 NAAQS in 1999 and 2000.[14] These data were available at the time of the SDEIS/FEIR, but were not

[12] Id.
[13] Id.
[14] See Table 1 of the Summary of Environs Comments on SDEIS/FEIR Air Quality Analysis for Logan Runway Expansion (May 31, 2001); *See* Appendix B.

incorporated and presented in the SDEIS/FEIR. Since the PM-2.5 data is close to the ambient standard (and exceeds at some of these locations), it could be difficult for the project to demonstrate that future impacts from airport related emissions would ensure that the PM-2.5 standard is maintained. The SDEIS/FEIR states that there are no predicted violations of any state or federal ambient air quality standards now or under future conditions (Page 6-122). However, the SDEIS/FEIR does not present or evaluate the DEP PM-2.5 monitoring data which indicates that monitoring locations in Boston are not currently in compliance with the PM-2.5 NAAQS. The PM-2.5 is an ambient air quality standard now, and the available data indicates that the SDEIS/FEIR statement referenced in the prior sentence has not considered baseline PM-2.5 measurements as required by the base elements of an environmental study."[15]

The Secretary should find that Massport failed to present material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should determine that the Final EIR is inadequate and require Massport to file a Supplemental EIR with an expanded scope compelling Massport to include in its analysis their plan based on actual PM-2.5 monitoring data to comply with the revised ambient air quality standards; compelling Massport to set forth their commitment to comply with state and federal ambient air quality standards now and in the future.

G. The FAA's determination that the Preferred Alternative conforms with the Clean Air Act is erroneous.

As a result of their reliance on Massport's presentation of false information in regards to their air quality emissions analysis of the Preferred Alternative, the Federal Aviation Administration's (FAA) final NEPA determinations are inadequate.

As set forth in the Supplemental DEIS/Final EIR, the FAA erroneously determined that:

> "There are no air quality impacts associated with the Preferred Alternative. In fact, the Preferred Alternative provides air quality benefits when compared to the No Action Alternative."[16]

[15] Summary of Environ's Comments on SDEIS/FEIR Air Quality Analysis for Logan Runway Expansion (May 31, 2001); *See* Appendix B.
[16] Supplemental DEIS/Final EIR, Volume 1, page 1-44.

Based on the information presented in this section, and the simple fact that Massport never analyzed the air quality emissions of the Preferred Alternative,[17] the FAA has no basis to make the determination that "there are no air quality impacts associated with the Preferred Alternative" or that "the Preferred Alternative provides air quality benefits when compared to the No Action Alternative."

H. The FAA's determination that the Preferred Alternative conforms to the Massachusetts State Implementation Plan (SIP) is erroneous.

As set forth in the Supplemental DEIS/Final EIR, the FAA erroneously determined that:

> "Since the Preferred Alternative will result in a net reduction of emissions over the No Build alternative for both the 29M Low Fleet and the 37.5M High Fleet scenarios, the project advances the purposes of the Massachusetts SIP. Because the Preferred Alternative will not cause or contribute to any NAAQS violation in any area, and will not delay timely attainment of any NAAQS or any required emission reductions or other milestones in any area, the FAA finds that the Preferred Alternative conforms with the Massachusetts SIP, with the statutory requirements of 42 U.S.C. §7401 ands(sic) 7506(c)(1), and with the regulatory requirements of 40 C.F.R. Part 51, Subpart W and 40 C.F.R. Part 93, Subpart B."[18]

Based upon the information presented in this section, and the simple fact that Massport never analyzed the air quality emissions for the Preferred Alternative, the FAA has no basis to make the determination that "the Preferred Alternative conforms with the Massachusetts SIP with the Statutory requirements of 42 U.S.C. §7401 ands(sic) 7506 (c)(1), and with the regulatory requirements of 40 C.F.R. Part 51, Subpart W and 40 C.F.R. Part 93, Subpart B".

The FAA erroneously adopted Massport's false findings. It is clear and obvious from reviewing Section 6.4-2 of the Supplemental DEIS/Final EIR that Massport's analysis is of Alternative 1 (including peak-period pricing), not the Preferred Alternative.

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[17] As previously stated, Massport analyzed the air quality emissions comparing Alternative 1, which includes peak period pricing, to the No Action Alternative rather than the Preferred Alternative 1A, which does not include pea-period pricing.

[18] Supplemental DEIS/Final EIR, Volume 1, page 1-45.

The Administrator should determine that the Supplemental DEIS is inadequate and require Massport to redo their air quality emissions analysis using the Preferred Alternative 1A.

3. NOISE

Introduction

Aircraft noise is a serious yet often under appreciated and neglected form of pollution. Since the introduction of commercial jets in 1958, the noise problem generated from airport operations has become increasingly widespread, affecting millions of Americans.[19] Like other environmental problems aircraft noise affects millions of people every day, producing a number of short-term and long-term adverse effects. Research indicated that excessive noise could cause significant health problems such as hearing loss, hypertension, cardiovascular disease, gastrointestinal problems and other disorders.[20] In addition noise causes interference with communication, sleep deprivation and poor work and school performance due to lack of concentration.[21]

The Supplemental DEIS/Final EIR substantially underestimates and misrepresents the adverse noise impacts that would result if Proposed Runway 14/32 were built. The presentation of the Supplemental DEIS/ Final EIR is not only incomplete and confusing, but it is also very misleading. Many of the tables and contours regarding noise data present inaccurate and conflicting data. Moreover, rather than updating information or properly integrating actual existing data, the Supplemental DEIS/ Final EIR uses bad information and doctored data.

The Supplemental DEIS/ Final EIR is so defective and inadequate in presenting information for intelligent reaction and comment that it does not meet reasonable standards to be considered acceptable, and therefore takes away from the community an equitable opportunity to digest and understand the full intensity of the adverse affects of Massport's proposal.

In regards to noise, the primary deficiencies are:

A. Critical data required to understand the Project and the critical data required to understand INM output and test assumptions are missing.

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[19] *See* Donald F. Anthrop, *The Noise Crisis, in* NOISE POLLUTION AND THE LAW 3,14 (James L. Hildebrand ed., 1970).
[20] *See* Alice H. Suter, NOISE AND ITS EFFECTS 15,20-21,24-25 (Nov. 1991)(report prepared for the Administrative Conference of the United States); *Sidney A. Shapiro, Lessons From A Public Policy Failure: EPA and Noise Abatement*, 19 Ecology L.Q. 1,5 (1992); *See generally* D. DENNIS HANSEN & LEE A. SAUNDERS, HEALTH SUBCOMITTEE OF THE ENVIRONMENTAL IMPACT COMMITTEE OF THE REGIONAL COALITION OF AIRPORT AFFAIRS, THE ADVERSE HEALTH IMPACTS OF AIRPORT EXPANSION WITH PARTICULAR REFERENCE TO SEA-TAC INTERNATIONAL AIRPORT (May 5, 1992)
[21] *See* Suter, *supra* note 21, at 22.

B. The INM contours in the Supplemental DEIS/Final EIR are made using faulty assumptions and biased data.
C. The INM computer predictions of noise, even when using correct assumptions and unbiased data, systematically understate the actual noise measured by Massport's field monitors; and
D. The data presented by Massport in its various tables and contours are inconsistent throughout the Supplemental DEIS/Final EIR.

A. Critical data to understand the Project and to understand the INM output and test assumptions are missing.

The Integrated Noise Model (INM) is used to model the noise that results from aircraft operations. On-site noise monitor measurements, known as the "gold" standard, can and should be used to test, validate and adjust the INM computer predictions for actual site conditions. The INM predictions should be adjusted for reality.

1. The basic data and assumptions used to make noise predictions are not given.

To develop INM computer simulations, one requires detailed aircraft operational data. "Detailed operational inputs to the INM fall generally into three categories of information including:

- Daily numbers of daytime and nighttime takeoffs and landings by specific aircraft types,
- Typical flight path and runway geometry, and
- Average statistics on usage of each runway and flight path by various aircraft groups"[22]

These data are critical to the size and shape of the noise contour that is produced by INM. The assumptions one makes can greatly change the size and shape of the noise contours. For example, if one assumes that aircraft land and takeoff obliquely to the runway instead of in-line with the runway, then the noise predicted by INM "appears" in an erroneous area. Similarly, if one assumes a mix of very quiet aircraft such as small propeller aircraft in lieu of loud old jet aircraft, then the INM predictions will be too small.

It is incumbent that the Supplemental DEIS/Final EIR provide sufficient detail so that one can run the INM and test the resulting calculations and the assumptions made. The necessary data to perform this function has not been provided by Massport. Moreover, the information provided in the Supplemental DEIS/Final

17.53

[22] Supplemental DEIS/Final EIR, Volume 2, page 5-12.

EIR is insufficient, especially for the high RJ fleet Preferred Alternative, to understand or test assumptions or to independently run INM simulations.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

2. The landing operations to the Proposed Runway 32 are not explained.

Massport has provided insufficient information as to how or where aircraft fly when they land on Proposed Runway 32. For example, Figure 5.2-2 on page 5-17 of the Supplemental DEIS/Final EIR shows aircraft landing at an oblique angle to the proposed Runway 32. This oblique "landing flight track" continues right to the pavement of Runway 32. The only aircraft that can land in this manner are helicopters. There are no fixed wing aircraft that can land by flying an oblique angle to the runway pavement. In the Supplemental DEIS/Final EIR Massport fails to provide any explanation or discussion of how aircraft can possibly land the way that has been assumed for the INM computer simulation.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to explain the actual location of Proposed Runway 14/32; compelling Massport to explain the proposed flight path of aircraft landing on Proposed Runway 32; and compelling Massport to provide an explanation as to how an aircraft can land in the manner assumed for the INM Computer simulation.

3. Critical tabular data are missing in the Supplemental DEIS/Final EIR.

Table 5.2-5 on page 5-29 shows the full set of noise monitors operated by Logan Airport. But other tables like Table 6.2-11 on page 6-46 of the Supplemental DEIS/Final EIR omits the following sites:

Monitor 18	Nahant
Monitor 19	Swampscott

Monitor 20	Lynn
Monitor 21	Everett
Monitor 22	Medford
Monitor 27	Roxbury
Monitor 29	Mattapan
Monitor 30	East Boston

No explanation is given for the omission of data for these sites from all of the other tables in the Supplemental DEIS/Final EIR, but it certainly makes the document incomplete for the following towns and communities: Nahant, Roxbury, Dorchester, Swampscott, Lynn, Everett, Medford, Somerville, Dorchester, and Mattapan.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to present all data, positive or negative; compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

4. A whole operational scenario has been deleted from the Supplemental DEIS/Final EIR.

The Draft EIS contained a runway configuration with simultaneous landings on Runways 32 and 27, and with takeoffs on Runway 33L. This appears to be a very efficient set of runways since the smaller and larger aircraft can be well separated on landings. Also, many of the aircraft taking off on 33L can do so after the intersections of Runways 33L and 27 so that there is no conflict. This runway configuration was omitted from the Supplemental DEIS/Final EIR. 17.54

Professor Odoni, in his address to the Garvey Panel, said that the landings over the South Shore and the takeoffs to the northwest may have been underpredicted in the DEIS. Massport has responded to Professor Odoni by taking out all references to the very operations Professor Odoni claims were underpredicted (i.e. the runway configuration stated above). However, this runway configuration would significantly increase noise from takeoffs on 33L in communities such as Chelsea and Somerville.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to present all data, positive or negative; and compelling Massport to reanalyze its data using all significant data pointed out by the Secretary and Commentators rather than omitting information or simply presenting information in the scope or comments without any meaningful substantive analysis.

5. Additional Omissions and Misleading Information.

Massport presents the 1999 ESPR data, however they fail to make use of it in their analysis. The 1999 ESPR data should have been their base case, rather than the hypothetical, inaccurate 1999 29M case. 17.55

Massport presents the actual noise monitor data, however they do not use the actual data in their analysis. They failed to make any substantive use of the actual noise monitor data. Massport should have used all of its measured data to properly adjust for "airport only" conditions and to adjust the INM computer simulations and the assumptions thereto, to properly and consistently reflect reality.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

B. <u>The INM contours in the Supplemental DEIS/Final EIR are made using faulty assumptions and biased data.</u>

1. Assumed flight tracks are contrary to fact and contrary to other published Massport data.

The departure flight tracks supposedly used for the Supplemental DEIS/Final EIR are depicted in Figure 5.2-1 on page 5-15 of said document. In contrast, the 1999 ESPR published by Massport for Boston Logan International Airport (Logan)

shows takeoff flight tracks for Runways 22L and 22R.[23] Some of the 1999 ESPR flight tracks go directly over the main part of the Hull peninsula. Similarly, RADAR plots provided by the Logan noise office at public meetings show takeoffs directly over the main part of the Hull peninsula. However, in direct contrast, the Supplemental DEIS/Final EIR (Figure 5.2-1, page 5-15) fails to show any departure flight tracks over the main part of the Hull peninsula. Rather, the Supplemental DEIS/Final EIR only shows flights over water. This omission of takeoff flights over the main part of the Hull peninsula is contrary to published Massport data and Massport RADAR plots, and it is contrary to fact.

As a second example, the 1999 ESPR published by Massport for Boston Logan International Airport (Logan) shows landing flight tracks for Runways 33L.[24] The flight track presented in the 1999 ESPR shows the jet aircraft flight track going directly over Hull in a perfect line with the extended Runway 33L centerline. Also, RADAR plots provided by the Logan Noise Office at public meetings generally show landings along a straight line that is an extension of Runway 33L centerline, a line that goes directly over Hull. In contrast, the Supplemental DEIS/Final EIR (Figure 5.2-2, page 5-17) fails to show any arrival flight track in a straight line over Hull. Rather, the Supplemental DEIS/Final EIR creates a large set of "assumed" landing flight tracks that primarily go west of Hull over water. The substitution of a large set of landing flight tracks that avoid Hull in place of a single flight track over Hull is contrary to published Massport data and Massport RADAR plots, and it is contrary to fact.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

2. The Supplemental DEIS/Final EIR noise contours are inconsistent with the Supplemental DEIS/Final EIR flight tracks.

Figure 5.2-2 (page 5-17) of the Supplemental DEIS/Final EIR shows "Modeled Arrival Flight Tracks." Flight tracks for arrivals to Runway 33L are in line with

[23] 1999 ESPR for Logan, page F-5, Figure F-1-Jet Departure Flight Tracks.
[24] 1999 ESPR for Logan, page F-7, Figure F-2-Jet Arrival Flight Tracks.

the extended Runway 33L centerline from about 4 miles from the runway up to the threshold of the Runway. Figure F-2 on page F-7 of the 1999 ESPR published by Massport shows a single arrival flight track to Runway 33L that is precisely the extended Runway 33L centerline. Both the Supplemental DEIS/Final EIR and the 1999 ESPR note that differences between the 1999 ESPR and the 1998 Annual Update are small. The Supplemental DEIS/Final EIR states:

> "While the 1999 Environmental Status and Planning Report published in December 2000 includes updated analyses for 1999, the differences between the two study years are small. Between 1998 and 1999, operations declined by 2.5 percent, primarily due to a decline in regional carrier operations. Since the fleet mix and runway use varied little, the shape of the noise contours and the population impacts were also similar..."

Figure 6.2-9 on page 6-33 of the Supplemental DEIS/Final EIR compares the 1998 Annual Update contours with the 1999-29M Low No-Build prediction of the Supplemental DEIS/Final EIR. Also, Figure 6-3 of the 1999 ESPR shows the 1999 DNL noise contours for Logan. In both the contours and in the 1998 Annual Update contours and the 1999 ESPR contours, the "tips" of the noise contours going towards Hull follow the landing flight track to Runway 33L over Hull, the extended centerline of Runway 33L. However the "tips" of the 1999-29M Low No-Build prediction of the Supplemental DEIS/Final EIR (Figure 6.2-9 on page 6-33) drop approximately 5 degrees south of the landing flight track to Runway 33L over Hull, the extended centerline of Runway 33L. This is not an accidental discrepancy in just this figure; a similar discrepancy is evident in Figure 5.2-3 on page 5-21 of the Supplemental DEIS/Final EIR. This discrepancy that appears is simply not possible. The only simple explanation for this discrepancy is that the contours in the Supplemental DEIS/Final EIR were made with flight tracks other than those shown in the Supplemental DEIS/Final EIR or the contour generation otherwise deviates from the data given in the Supplemental DEIS/Final EIR.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; compelling Massport to redo its tables and contours so that they are consistent with the information presented; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in

sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

3. The assumptions in the SDEIS/FEIR regarding the aircraft fleet are inappropriate.

The Supplemental DEIS/Final EIR appears to assume that all or nearly all of the large jet aircraft fleet will be true, Stage-3, quiet aircraft. None or nearly none of the large jet aircraft are assumed to be Stage 2. This assumption is contrary to the expressed position of the United States Government from the President on down. The United States Government has consistently championed the right of U.S. carriers to fly retrofit Stage-2 aircraft for as long as they want to the great consternation of the European Community. Although airport operators, including Logan, have expressed the desire to see the removal of retrofit Stage 2 aircraft from the fleet, there is no movement on the part of the United States Government or the Air Traffic Association in this direction. Therefore, Massport has no basis for assuming the elimination of retrofit Stage 2 aircraft from the fleet. 17.56

The Supplemental DEIS/Final EIR in the High RJ scenario assumes that the increase in RJ operations will coincide with a decrease in large jet operations. While it may be true that the RJs are used to replace some DC-9s, B727s, or MD80s as well as replacing small prop aircraft, it is inconceivable that a EMB 145 (50 passenger commuter jet) will replace a B747 on a flight from Boston to London. However, in the Supplemental DEIS/Final EIR the High RJ Fleet shows a reduction of heavy jets like the B747 with a commensurate increase in RJ operations. Naturally, a RJ operation produces much less noise than does the B747 that it replaces. Specifically, B-747 go from 20.5 operations per day under the 37.5M High fleet to 2.2 operations per day under the 37.5M High RJ fleet; MD11 go from 17.9 operations per day to 4.2 operations per day; and the sum of 747, 757, 767, 777 and MD11 go from 269 operations per day under the 37.5M High fleet to 169 operations per day under the 37.5M High RJ fleet. Only the 767 and 777 show small increases; everything else decreases precipitously.

The Secretary should find that Massport knowingly presented false information and manipulated data, and therefore should require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to update its analysis on the fleet mix at Logan using true and accurate data, and based on the updated data compel Massport to redo all of its noise data.

C. The INM computer predictions of noise, even when using correct assumptions and unbiased data, systematically understate the actual noise measured by Massport's field monitors

1. Systematic biases in the INM predictions are ignored in the Supplemental DEIS/Final EIR.

17.57

On page 5-28 of the Supplemental DEIS/Final EIR, the average differences between the "aircraft only" DNLs and the INM-generated values is given as 0.9 dB. This statement is used to justify the sole use of INM predicted results. However, there are three problems with this statement. First, it is not true. The actual difference is 1.5 dB; not 0.9 as quoted in the text. Second, there are systematic biases to the differences. For example, when the "airport only" levels are between 68 and 78 dB, then the average difference is 0.2 dB; when the "airport only" levels are between 58 and 68 dB, then the average difference is 1.0 dB; and when the "airport only" levels are between 48 and 58 dB, then the average difference is 3.1 dB. Therefore, for the lower DNLs, the INM is systematically under predicting by 3.1 dB.

Third, there may be systematic biases to the determination of the "airport only" levels. A companion study "Assessment of Airport Noise Monitoring at Hull"[25] shows that at Hull, the "airport only" levels are 2 dB too low. If this 2 dB offset is present in all of the "airport only" data, then the above stated systematic biases between measurement and prediction are 2.2, 3.0, and 5.1 dB rather than 0.2, 1.0 and 3.1 dB. (Note: a 3 dB increase is equivalent to a doubling of the number of aircraft and a 5 dB increase is equivalent to a threefold increase in the number of operations). Massport should have used all of its measured data, properly adjusted for "airport only" conditions, to adjust the INM computer simulations and the assumptions thereto, to properly and consistently reflect reality.

This companion study also shows that the systematic bias at Hull is 3 dB. At least one decibel of the error in predictions using INM occurs at Hull because of the "sound propagation over water" situation. Massport, to its credit, corrects for sound propagation over water, but only when the aircraft are below 1000 feet AGL. By Hull and many of the other areas, the aircraft are above 1000 feet but the water surface is still a factor in enhancing the sound propagation. Two other decibels of error can be attributed to known errors in the INM sideline predictions of noise that result from engine installation effects and other propagation effects.[26]

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[25] *Assessment of Airport Noise Monitoring at Hull, MA*, Paul Schomer (May 31, 2001); *See* Appendix C.

[26] Because of these known biases, the current INM sound propagation algorithms are currently under revision by the Society of Automotive Engineers A-21 Aircraft Noise Committee.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning to include sound propagation over water, over 1000 feet AGL; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

2. The noise contours do not go low enough in level to adequately describe the true impacts.

The Supplemental DEIS/Final EIR predicts DNL noise contours as low as 60 dB but they term the 65 dB DNL contour as "the threshold of noise incompatibility with residential land uses."[27] The use of a DNL criterion of 65 dB is simply outmoded and unacceptable. As the companion study concludes:[28]

- Nearly all agencies and boards, standards setting bodies and international organizations that have cognizance over noise producing sources use a DNL criterion value of 55 dB as the threshold for defining noise impact in urban residential areas. In fact, of this large number of agencies, boards, standards setting bodies, and international organizations, only the Department of Defense (DOD) and the Federal Aviation Administration (FAA) suggest a criterion value for DNL that is higher than 55 dB.

- The policies of FAA/DOD (and HUD) all were developed in the early 1970's and earlier (e.g., HUD, 1971). In contrast, most of the agencies and boards, standard setting bodies and international organizations have established their policies after 1995. In particular, the World Health Organization recommendations (WHO, 1999) are based on over 25 years more worldwide research into noise effects than are the earlier FAA/DOD policies.

- Significant evidence exists to suggest that aircraft noise is more annoying than is road traffic noise for the same DNL level.

- Of all of the boards and agencies, standards setting bodies, and internationals organizations, one should consider the World Health Organization and the National Research Council (NRC) as the primary authorities on acceptable levels of pollutants. They are charged with developing this type of scientific position and have clearly spoken. WHO terms DNL 55 dB as engendering

[27] Supplemental DEIS/Final EIR, Volume 1, page 5-20.
[28] *A White Paper: Assessment of Noise Annoyance*, Paul Schomer (April 22,2001); *See* Appendix D.

serious annoyance and creating an unhealthy environment and WHO terms DNL 50 dB as engendering moderate annoyance. The NRC goes further, and, in many instances, recommends assessments when the project noise exceeds a DNL 40 dB.

- No single DNL criterion is equally applicable to all residential situations and all types of residential communities. A sizeable number of agencies and boards, standards setting bodies, and international organizations that have cognizance over noise producing sources recommend a DNL criterion value that is less than 55 dB as the threshold for defining noise impact in sparse suburban and rural residential areas. Rural areas require a criterion that is 10 dB lower than the criterion used in normal urban areas.

- For residential areas and other similarly noise sensitive land uses, noise impact becomes significant in urban areas when the DNL exceeds 55 dB. In suburban areas where the population density is between 1250 and 5000 inhabitants per square mile, noise impact becomes significant when the DNL exceeds 50 dB. And in rural areas where the population density is less than 1250 inhabitants per square mile, noise impact becomes significant when the DNL exceeds 45 dB.

Moreover, according to the August 2000 GAO Report *Results From a Survey of the Nation's 50 Busiest Commercial Service Airports* people outside the 65 dB DNL contour are substantially impacted by noise under 65 dB. This report indicates that 70% of airport noise complaints come from individuals in areas outside of the 65 dB DNL contour.[29]

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning to include sound propagation over water, over 1000 feet and using the criterion values of 55 dB and 45 dB as thresholds for defining noise impacts in urban and residential areas; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

[29]*See* Figure 25 of GAO Report (August 2000): Portion of Airports' Noise Complaints That Come From Areas Outside the 65 dB DNL Contour, a true copy of which is attached hereto in Appendix F.

D. <u>The data presented by Massport in its various tables and contours are inconsistent throughout the Supplemental DEIS/Final EIR.</u> 17.58

1. Critical numerical values are inconsistent in the SDEIS/FEIR from one table or figure to another.

Many of the tables and contours presented by Massport regarding noise data present inaccurate and conflicting data. For example, Table 6.2-11 on page 6-46 gives the predicted DNL at the Hull monitor as 55.6 dB for the 37.5M High Fleet whereas Figure 6.2-8 on page 6-29 gives this value as about 59 dB, a discrepancy of 3 to 4 dB. Note: a change of just 3 dB is equivalent to a doubling of the number of aircraft operations.

Similarly, but for the High RJ fleet, Table 6.2-24 on page 6-74 gives the predicted DNL at the Hull monitor as 55.7 dB for the 37.5M High RJ Fleet whereas Figure 6.2-11 on page 6-59 gives this value as about 60 dB, a discrepancy of 4 to 5 dB and a 5 dB increase is equivalent to a threefold increase in the number of aircraft operations. This same value of 55.7 dB at the Hull monitor for the 37.5M High RJ fleet is replicated in Table E.1[30] of Volume 3 of the Supplemental DEIS/Final EIR. Table E.2[31] of Volume 3 of the Supplemental DEIS/Final EIR gives the nighttime equivalent level at the Hull monitor as 58.3 dB. However, this nighttime equivalent level using standard equations calculates to a DNL that is at least 64 dB before adding in daytime noise. With daytime noise, the DNL at the Hull monitor according to this table for the 37.5M High RJ fleet is 65 dB, a discrepancy of almost 10 dB between Table E.1 or Table 6.2-24 and Table E.2. Note: a change of 10 dB is equivalent to a tenfold increase in the number of aircraft operations.

In summary, there are three different values for the 37.5M High RJ fleet DNL prediction at Hull in the Supplemental DEIS/Final EIR, two in tables and one in a figure. All three should be the same, however all three are different. The difference from the smallest to the largest is almost 10 dB. Similar discrepancies are present for the 37.5M High fleet. It is simply impossible to make any sense of a report that has such glaring discrepancies for critical information like the predicted noise levels.

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[30] Table E.1 INM-Computed Day-Night Sound Levels at Specific Points for 1998 and for All Study Alternatives—2015 High Regional Jet Fleet.

[31] Table E.2 INM-Computed Nighttime Equivalent Sound Levels at Specific Points for 1998 and for All Study Alternatives—2015 High Regional Jet Fleet.

2. Table 6.2-1 versus Appendix E "Excerpt from the Airside Draft EIS/EIR". 17.59

Table 6.2-1 on page 6-9 is titled: "Average Daily Operations for 1998 and for Future 29M Low and 37.5M High Fleet Scenarios for the No Action Alternative and the Preferred Alternative." There are two lines for the 29 M Low section of this table and two lines for the 37.5M High section of this table; in each case, one line is for the No Action Alternative and one line is for the Preferred Alternative. Supposedly, these are the fundamental predictions of numbers of aircraft for the entire EIS.

Appendix E, page 1 contains an "Excerpt from the Airside Draft EIS/EIR". The top table on this page is labeled: "1999 and 2010 Logan Average Daily Operations—Without Peak Period Pricing (Alternative 1A and 4). Line entries in this table include one line noted as "1999 – 29M Low" and one line noted as "2010 – 37.5M High."

From the titles it would seem that these two tables should have the same data, however they do not. First, Table 6.2-1 indicates that the numbers of operations differ between Alternatives 4 and Alternative 1A (there are two lines so labeled for each fleet alternative). However, the table in Appendix E indicates that the numbers of operations are the same for Alternative 4 and Alternative 1A. This discrepancy exists for both the 29M Low case and for the 37.5M High case. Second, the numbers of operations listed in the table on Page 1 of Appendix E for the 29M Low case do not agree with either of the lines in Table 6.2-1 for the 29 M Low case. Third, the numbers of operations listed in the table on Page 1 of Appendix E for the 37.5M High case do not agree with either of the lines in Table 6.2-1 for the 37.5 M High case. The numbers of operations are fundamental to the INM predictions but are conflicting in the Supplemental DEIS/Final EIR.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; compelling Massport to redo its tables and contours so that they are consistent with the information presented; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

E. Summary of action sought in regards to Massport's noise data presented in the Supplemental EIS/Final EIR.

1. The Secretary should make a determination that Massport, throughout the MEPA review, knowingly presented false information and manipulated data, and therefore the Secretary should require Massport to file a new ENF and begin the MEPA review process again.

2. The Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope in which the Secretary shall:

   - Compel Massport redo all of its noise data from the beginning;
   - Compel Massport to use true and correct data, i.e. actual flight track information, actual Monitor measurements, etc., rather than false and misleading information;
   - Compel Massport to present all data positive or negative;
   - Compel Massport to reanalyze data using all significant data as pointed out by the Secretary and Commentators rather than simply presenting information requested in the scope and comments without any meaningful substantive analysis;
   - Compel Massport to redo its tables and contours so that they are consistent in the information presented; and
   - Compel Massport to present the data in a clear and easy to understand format that would permit the public to review and understand the material and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate the Massport INM modeling results and test the underlying assumptions.

4. DELAY

Massport's analysis of the delay reduction benefits associated with the implementation of the Preferred Alternative is inadequate.

After a thorough review of the documents published by Massport[32], it is not possible to determine how the specific delay estimates were prepared for the base case or any of the future scenarios developed by Massport in the materials reviewed. While many parts of the analysis and some assumptions are disclosed, they are often disclosed in separate documents representing work at different time

[32] *Logan Airside Improvements Feasibility Study* (Phase 1 Report, July 20, 1995); *Logan Airside Improvements Planning Project – Draft Environmental Impact Statement/Report* (EOEA #10458, February 1999); and *Logan Airside Improvement Planning Project – Supplemental Draft Environmental Impact Statement/Final Environmental Impact Report* (EOEA #10458, February 2001)

periods with subsequent adjustments. In addition, Massport does not fully disclose the inner workings of the models they used in their analysis. Moreover, nowhere in any of the reviewed documents is there a concise description of the key assumptions made about capacity under the various configurations, how aircraft are assigned to operate or specific runways when these configurations are in use, and how the resultant delays, if any, have been estimated.

A. Massport's DELAYSIM Model Results Are Inadequate.

Massport makes reference to two models, which have been used in their analysis: FLAPS and DELAYSIM. However, the DELAYSIM model simulates how controllers assign aircraft to runways under specific weather conditions and with the objective of meeting goals under the Preferential Runway Advisory System (PRAS) program for Logan. Nowhere, in the documents reviewed, is the proportion of such operations assigned to each runway disclosed or is the methodology by which this is done. Rather, all Massport presents in the documentation are the results of such assignments. Therefore, it is not possible to know whether there were other feasible assignments of aircraft to runways that produce greater benefits.

While Massport presents some data on airport configurations and nominal capacities, they are from 1995. In addition, these data are manipulated within the DELAYSIM model to reflect controller compliance with PRAS, and one cannot relate the specific inputs to the outputs produced in terms of delay, runway utilization and so forth.[33] Massport failed to present any detailed data as to how runway assignments under PRAS were made, and at which point controllers shift from one airfield configuration to another.

B. The Preferred Alternative Will Increase Capacity at Logan.

Massport repeatedly asserts that implementation of the Preferred Alternative will not increase capacity at Logan. Instead, Massport states that implementation of the Preferred Alternative will reduce delays during Visual Flight Rule (VFR) operations under northwest wind conditions. The analysis also shows that without construction and use of Proposed Runway 14/32 average delays would become excessive during the forecast horizon.[34] As such, these lengthy delays (average of 38.8 to 54.5 minutes per operation) would likely lead to cancellation of flights at Logan.[35] Proposed Runway 14/32, by allowing such operations to take place, may not increase the calculated capacity of the airport under its highest activity

[33] Supplemental DEIS/FEIR, Volume I, pages 4-14.
[34] See Charts 1 and 2 presented at the end of this section.
[35] Massport's simulation results also show that delays of over three hours are from three to five percent of operations, but they account for about one half of total delay hours. See Appendix C.3 of the SDEIS/FEIR.

configuration, but it does allow more operations per hour to take place. In the Supplemental DEIS/Final EIR, Massport suggests that the service quality improvements would not induce additional demand beyond the forecast levels. While this may be correct, in part, it is clear from the analytical results presented by Massport that the addition of a new runway will allow operations to take place that would otherwise be subject to cancellation due to excessive delays or operations that would be reduced by the peak- period pricing system proposed by Massport.

Professor Amedeo R. Odoni, the T. Wilson Professor of Aeronautics and Astronautics at MIT presented testimony before the Boston Logan International Airport Supplemental Draft EIS Panel (SDEIS Panel) on September 27, 2000.[36] Professor Odoni told the SDEIS Panel that the delay-reduction benefit of a new runway would be real, but temporary as demand grows and conditions worsen. Professor Odoni also testified that delay-reduction benefits of the proposed 5,000-foot runway might be reduced by the switch from turboprops to regional jets. Contrary to Massport's presentation and treatment of peak-period pricing as an important delay-reduction option, Professor Odoni gave high marks to peak-period pricing as a important delay-reduction option saying that a 1% reduction in flights could reduce delays by 7%. As noted in this comment, the benefits of peak-period pricing are not negatively impacted by changes in fleet mix.

C. Massport and the FAA Overestimate the Delay-Reduction benefits of Proposed Runway 14/32.

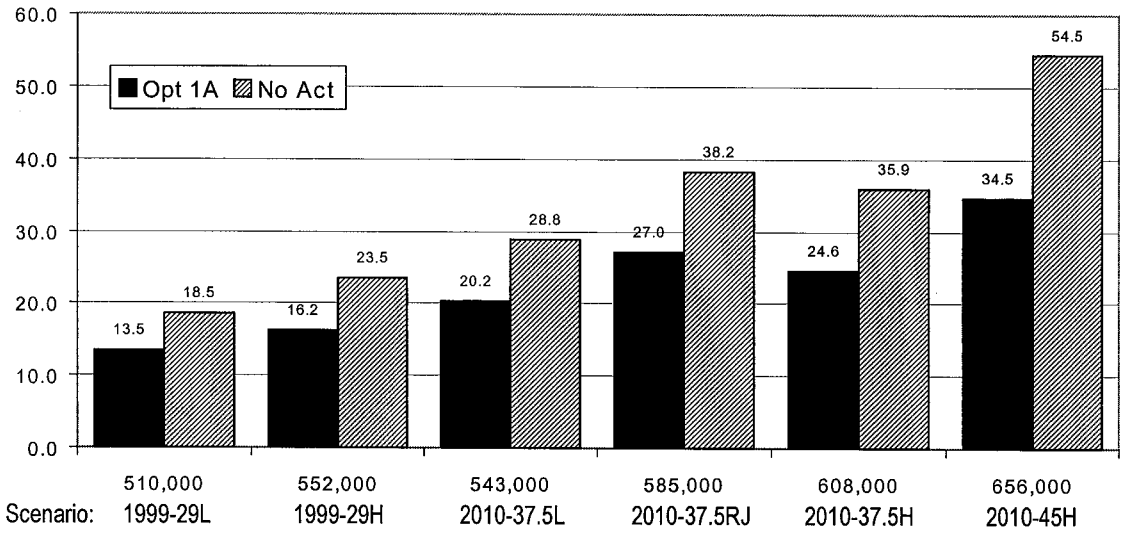
The delay results are particularly sensitive to the percentage of operations by regional jets, as shown in the 37.5M High RJ scenario. It appears that Massport and the FAA make relatively optimistic assumptions about regional jet use of Proposed Runway 14/32, which is only 5,000 feet long.[37] The required landing field lengths are noted as "minimum landing distances" for regional jets. In addition to the manufacture performance data which Massport and/or the FAA have analyzed to determine required runway lengths for regional jet aircraft likely to use Proposed Runway 14/32, interviews should have been conducted with operators of regional jets to determine what airline-specific operating manuals call for as far as landing distances, usable runway length required and related parameters.[38] The Supplemental DEIS/Final EIR does acknowledge that the minimum landing distances will likely exceed 5,000 feet under wet conditions, however, it fails to report on the minimum landing conditions for higher

[36] A draft copy of the minutes of the September 27, 2000 SDEIS Panel are included in Appendix F of this document.
[37] Supplemental DEIS/Final EIR, Appendix C.4.
[38] See our discussion on beginning on page 9 of this comment regarding minimum landing conditions of regional jets that use Logan, as well as pilot response to the use of a 5,000 foot runway.

temperatures or higher humidity days, which may increase required runway lengths beyond 5,000 feet, and thus adding to the reality that Proposed Runway 14/32 may not decrease delays to the extent represented by Massport.

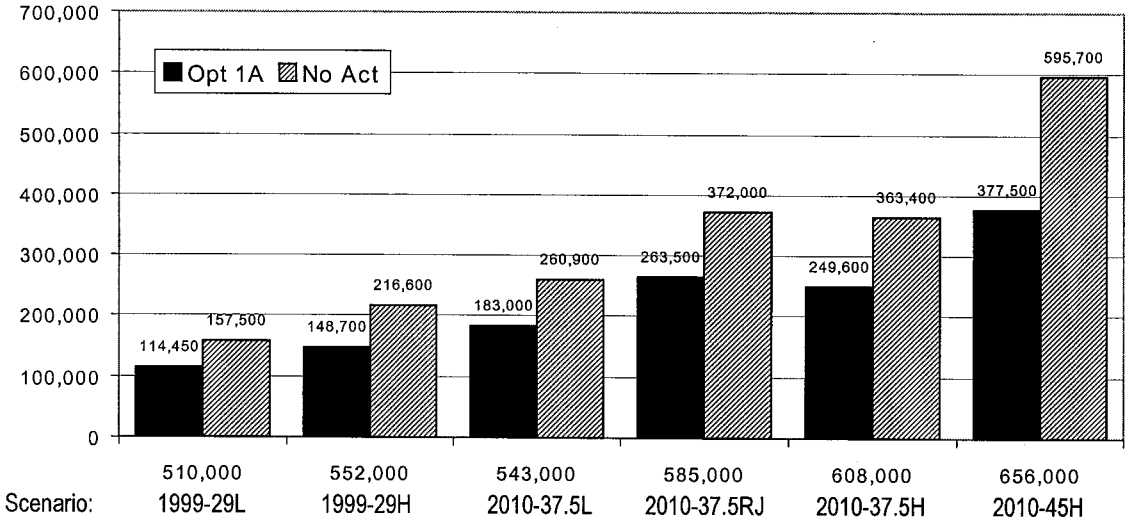
The Secretary should find that Massport omitted material facts, and therefore, the Secretary should require Massport to file a new ENF. Alternatively, the Secretary should determine that the Final EIR is inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to include all of the data and input parameters used so that the public would have the opportunity to understand how the delay estimates were prepared and to determine the reasonableness of Massport's delay analysis; compelling Massport to redo its delay simulations using the true and accurate fleet mix at Logan, and including in their analysis the minimum landing conditions of the regional jet fleet using Logan, as determined by airline specific operating manuals and regional jet pilot preference, as well as the minimum landing distances under various conditions, such as wet surfaces, high temperatures, high humidity and so forth.

Chart 1
AVERAGE RUNWAY AND TAXIWAY DELAY MINUTES/OPERATION



Source: Calculated from Chart 2

Chart 2
RUNWAY AND TAXIWAY DELAY HOURS



Source: DEIS/FEIR Table 4.6-1 and DEIS Table 4.5-1

5. COMMUNITY AND ECONOMIC IMPACTS.

Massport's treatment and analysis of economic benefits resulting from the implementation of the Preferred Alternative is inadequate.

A. <u>The Supplemental DEIS/Final EIR Discussion of Economic Benefits is Misleading and Unsubstantiated.</u>

The Project Proponent promotes the concept that the Preferred Alternative will provide a net regional economic benefit in the form of time reductions attributable to eliminated delay, in the range $300 million. These theoretical benefits exceed the strict scope of the construction project associated with the preferred alternative, but are still presented as tangible evidence of the overall positive impact of the project on local economic systems.

B. <u>The Supplemental DEIS/Final EIR Fails to identify or Discuss Negative Economic Impacts.</u>

17.60

There are other economic impacts associated with the Project that should be considered, but are not in the FEIR. Chief amongst these are the negative economic impacts resulting from reductions in property values in adjoining communities that can be directly attributable to disturbances resulting from an

radically increased frequency of aircraft overflights of these communities due to the projected operations of the Runway 14/32.

C. <u>The Supplemental DEIS/Final EIR Fails to Identify or Analyze Impacts on Property Values and Municipal Tax Revenues.</u>

To justify ignoring the impacts on local property values and the property tax ratable revenue streams to local communities, Massport turns to a strict interpretation of land use and social impacts associated with the project. In citing only the impacts attributable to direct construction as factors in local land use and social impacts, Massport errs in ignoring the effects of the operations of the Preferred Alternative. This narrow construction is incorrect and inappropriate.

D. <u>The Supplemental DEIS/Final EIR Fails to Consider Financial Mitigation for Impacted Communities.</u> 17.61

Massport also errs in instances where they argue that impacts on local communities need only be considered in cases where alterations of noise contours are anticipated to change the composition of the mix of residents and residential neighborhoods are anticipated. Other sections of this comment note that the methods and data utilized to construct such noise impact areas are fatally flawed and should be revised. We respectfully demand that Massport calculate the impact on local property values and local government revenue streams associated with property tax rates from operations of the Preferred Alternative and that Massport commit to the implementation of appropriate fiscal mitigation measures, such as aviation easement payments or other similar compensation schemes as a component of the Preferred Alternative.

E. <u>The Supplemental DEIS/Final EIR Ignores Studies that Document Negative Impact of Airport Operations on Property Values.</u> 17.62

Massport may argue that little empirical evidence suggests that property value impacts can be successfully associated solely with aircraft operations disturbances, and that, in any case, such impacts cannot be measured accurately. This is not the case. In 1994, the consulting firm of Booz, Allen & Hamilton prepared a report titled *The Effect of Airport Noise on Housing Values* for the Federal Aviation Administration. In this report, they reported on work undertaken to design and implement a methodology for evaluating the effects of airport operations noise on property values, based primarily on a comparables analysis study design. In pilot studies using this method, Booz-Allen found that the effect of noise on prices was:

- Highest in moderately priced and expensive neighborhoods

- **A difference in property values equal to 18.6% per 1.33 percent per dB of additional quiet between properties in neighborhoods that differed only by the effects of airport operations.**

F. Studies Demonstrate Severe Impacts on Property Values Independent of Noise Impacts.

Other studies confirm such findings. A 1996 study funded by the State of Washington found, using a similar comparable analysis method, that the proposed expansion of Seattle-Tacoma (Sea-Tac) Airport would cost five nearby cities $500 million in property values and $22 million in property tax revenues. In studying moderately priced housing in average neighborhoods, the study found that a housing unit in the vicinity of the airport would sell for 10.1% more if it were sold elsewhere. **The Washington study also concluded that the impact was not directly related to noise levels – but rather only to the "shadow" effects of being underneath the flight tracks of either arriving or departing aircraft.**

G. Aircraft Operations Can Reduce Property Values Up to 20%.

Another Sea-Tac study published in 1998 ("The Impact of Airport Operations on Land Values"; Theodore Lane, Ph.D.; presented at the 32nd Annual Pacific Northwest Regional Economic Conference) using multiple regression estimate techniques that confirmed that only the "shadow" effect is needed – regardless of specific noise levels – to negatively impact property values. Dr. Lane's estimate of the impact of new runway construction on communities in the path of flight tracks found that, other things being equal, the value of a house and lot increases by about 3.4% for every quarter of a mile the house is farther away from being directly underneath the flight track of an arriving/departing aircraft. The effect is active for the width of the flight track, between ½ and ¾ of a mile, typically. This would also confirm a devaluation in the range of 10-20%.

H. Massport's Proposed Expansion Could Cause Property Devaluation up to $500,000,000.00 in the Boston Metropolitan Area.

What do these studies mean for our local economy? In areas where flight tracks typically cross a large proportion the real property assets of a local jurisdiction, the reduction in resident welfare attributable to personal loss of value and the reduction of tax receipts and city services may well be catastrophic. **As an example, if we assume that only 30% of the real property assets in the Town of Hingham were affected by a 15% reduction in value, then, based on a tax base of $2 billion, Hingham residents would lose over $90 million in personal wealth and the Town, over $1.5 million in tax revenue.** This is highly conservative estimate, based on only one town that will be affected by the

proposed tripling of aircraft overflights on the South Shore and other parts of the Metropolitan area. **The property devaluation effects of the Preferred Alternative can be reasonably expected to approach up to $500 million or more, based on the studies cited above.** That such effects are not considered in the FEIR is inexcusable.

Such impacts are focused only on one facet of the reduction in value of the quality of community life attributable to aircraft overflight, regardless of noise level. Our region's right to quiet enjoyment of our education facilities, our recreational facilities and our natural environment is seriously and tangibly threatened by an incursion of aircraft "shadow effects" that are cynically and parochially ignored in Massport FEIR. We urge the Secretary to find the FEIR inadequate and to require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to undertake a full analysis of the socio-economic impacts of the proposed Project, including a detailed community by community analysis of property devaluation and impact on local tax revenues.

6. ENVIRONMENTAL JUSTICE

Massport's analysis of environmental justice issues is inadequate. While the Supplemental DEIS/FEIR offers expanded review of environmental justice implications, there remains relevant and compelling information that has not been disclosed or factored into the analysis.

The Supplemental DEIS/FEIR do not meet the requirements of the Executive Order and the DOT Order. Executive Order 12.898 entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" requires each federal agency to identify and address environmental and health effects of its activity that particularly burden minority and low income communities. A purpose of the executive order is to force agencies to improve their decision-making processes. In response to the executive order, the US Department of Transportation prepared an environmental justice strategy and issued its own Order on Environmental Justice. The DOT order is intended to ensure that a process for the assessment of environmental justice factors becomes common practice in the application of NEPA. It attempts to incorporate environmental justice principles in all DOT activities by fully considering these principles throughout the planning and decision making processes in the development of programs, polices, and activities, using the principles of the National Environmental Policy Act.

Additionally, in the Secretary's Certificate, Secretary Durand noted " that in the past legitimate environmental interests of low income and minority areas too

often have "flown under the radar" of the environmental review process--application of the principles of environmental justice is intended to ensure that low income and minority populations are accorded the same standard that applies to those in other areas." The Secretary went on to request that Massport provide detailed demographic data on the affected populations as well as a discussion of the community participation process used in preparing the Draft and Final EIRs. And finally he noted that he was looking for concrete mitigation measures in the final documents that will maintain or reduce the existing envelope of cumulative environmental impacts from airport operations.

In specific, concerns about the environmental justice analysis include:

A. <u>The Supplemental DEIS/Final EIR Discussion of Environmental Justice Issues Fails to Include the 2000 Census Data.</u> 17.63

Massport failed to include the most relevant information available to consider environmental impacts in specific areas. The 2000 census data were completely ignored in the filings. It is the responsibility of Massport to show precisely how the population mix has changed since the last census in 1990. At that time, it was shown that East Boston, the community most directly impacted by the proposed project, had 18% of its residents of Hispanic heritage, 13 percent were members of non-white minorities, and 18 percent were white people with incomes below the poverty level. (*See* U.S. Department of Commerce, Bureaus of Census, "1990 Census of Population and Housing," Summary Tape Files 1,3). The Asian-American and Hispanic groups in the East Boston community have grown substantially since 1990 and the impacts of this project on those communities, as well as the minority and low income communities in Logan's flight path, should have been considered for the purposes of both the NEPA and MEPA review.

B <u>The Supplemental DEIS/Final EIR Fails to include comprehensive Public Health Information.</u> 17.64

While this edition of the process has included substantially more data on recent health studies impacting communities surrounding the airport, the documents have still not adequately addressed historical patterns of exposure to environmental hazards and multiple and cumulative exposure are barely analyzed. Despite the availability of the 2.5M particulate monitoring data obtained from the monitors in these communities, which is relevant to such health concerns as asthma and pulmonary disease, the Supplemental DEIS/Final EIR fails to include, analyze or evaluate this critical data, and to determine its public health significance.

C. The Supplemental DEIS/Final EIR must include additional Communities. 17.65

Using Suffolk County as the sole reference community in the environmental justice analysis does not fully address the possible disproportionate high and adverse impacts of the project. Using the reference area results in an exceedingly narrow basis for comparison since Suffolk County is small and made up largely of communities impacted by the airport. No doubt Suffolk County is a reference point, but any reasonable analysis must include other reference communities to present fully the environmental justice implications of expanding Logan.

An environmental justice assessment should address how the population that benefits from the project compares with the population that is burdened with the project's adverse impacts. Comparing the communities that use the airport with communities that bear the burden of the airports impacts would help illuminate the relative benefits and burdens of the project and the corresponding environmental justice implications.

Additionally, any analysis would be strengthened by a comparison of communities that would be impacted by alternatives to expanding operation at Logan.

D. The Supplemental DEIS/Final EIR Fails to Properly Review Impacts of Odors. 17.66

Many of the chapters gloss over the litany of issues impacting the communities surrounding the airport. Odor, while noted, was not explored in detail as to the impact on the communities closest to Logan. The odors have a disproportionate impact on communities such as East Boston and are one in a long list of indirect impacts that have not been factored in as part of a formal review. Massport does not consider emission factors and dispersion/exposure models in the analysis of this concern.

E. The Supplemental DEIS/Final EIR did not provide for Maximum Public Participation. 17.67

While Secretary Durand clearly called for extensive public participation, Massport only held 1 public meeting on the Supplemental DEIS/FEIR in Boston for the public and at that hearing they limited comments to 3 minutes as opposed to the 5 minutes that were promised. The report should have been produced in its entirety in Spanish and Portuguese, but was not.

Community input was sought through a special advisory panel, the SDEIS Panel, which was found by some of it's own members and government observers to be biased and non-inclusive.

F. The Supplemental DEIS/Final EIR understated Air Quality Data that Impacts Neighboring Communities.

Massport's failure to include air emissions inventories for the Preferred Alternative prohibits any accurate analysis of air emission related impacts. (*See* the Air Emissions Section of this Comment.)

The Secretary should find that Massport has omitted material facts, and therefore should require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo its environmental justice analysis using the 2000 Census data; compelling Massport to do a more comprehensive historical patterns of exposure to environmental hazards and multiple and cumulative exposure analysis; and compelling Massport expand its comparison of communities (i.e. beyond Suffolk County) by comparing the communities that use the airport with communities that bear the burden of the airports impacts would help illuminate the relative benefits and burdens of the project and the corresponding environmental justice implications.

II. ALTERNATIVES NOT ADEQUATELY ADDRESSED

1. PEAK-PERIOD PRICING

A. Massport analysis of Peak-Period Pricing is Inadequate and Misleading.

Massport's treatment and analysis of peak-period pricing is inadequate. Massport's analysis has failed to give appropriate consideration to congestion pricing as a critical and necessary strategy in reducing delays at Logan.

Massport's Preferred Alternative recommends that a new runway be built first, then if conditions warrant, that peak-period pricing be implemented as a future consideration. "This approach is not consistent with accepted economic efficiency guidelines for maximizing the social net benefits from a public project. The policy that is consistent with accepted efficiency guidelines is to first set optimal take-off

and landing congestion charges for all aircraft and then determine, based on cost-benefit grounds, whether it would be desirable to build an additional runway."[39]

Massport, in its analysis of peak-period pricing, once again misrepresents and manipulates their analysis to meet their self-serving needs. As in every other section of the Supplemental DEIS/Final EIR, Massport states the conclusion it wants without establishing the factual baseline necessary for any accurate analysis. In the case of peak-period pricing and their decision to build Proposed Runway 14/32, before the implementation of peak-period pricing, Massport has failed to conduct the cost-benefit analysis necessary for an economic factual baseline. "Principles of project evaluation for public projects, sometimes known as cost-benefit analysis, identify optimal pricing and investment as key components for efficient management of public projects such as airport infrastructure. Each component has a critical role. Optimal pricing ensures that the airport is not over or under used by making each user pay the additional cost of serving them. With optimal pricing, one can assess how much additional capacity users are willing to pay for. Any investment decision should be based on cost-benefit analysis, which implies that the efficient size of the public facility is where the extra benefit of an additional unit of investment is equal to the extra cost of the additional investment."[40]

"This conceptual framework is extremely relevant for airport projects because it indicates that efficient management of airport capacity calls *first* for the authority to institute efficient congestion pricing, and then decide on cost-benefit, whether it is desirable to build an additional runway. Therefore, pricing serves as a "signal" for efficient investment. Without pricing in place, it is possible, for an airport to make inefficient investments in runways. For example, if landing fees in the peak period are set too low, then the airport will be more congested than if landing fees were set higher to reflect congestion costs, making it appear that new capacity is warranted, when, in fact, it may not be."[41]

Massport recommends that congestion pricing be considered after the runway is built. This is an incorrect sequencing of policies meant only to expand the capacity of Logan Airport. In the DEIS/R and the Supplemental DEIS/Final EIR, Massport attempts to justify this approach by suggesting that peak-period pricing only makes sense when there is over scheduling by airlines. This is simply not true. "Congestion pricing and runway investments by their very nature are designed to 'expand' airport capacity."[42] "It is difficult to understand why a 17.68

[39] *The Importance of Peak-Period Pricing at Logan.* Steven A. Morrison & Clifford Winston (May 2001). See Appendix G.
[40] Id.
[41] Id.
[42] Id.

runway investment would be a successful strategy under certain conditions of aircraft demand, but that congestion pricing would not be successful under these same conditions. Congestion pricing reduces delays by spreading out demand for the use of the airport throughout the day and reducing demand on peak-period capacity. Because *fewer* aircraft wish to use peak-period capacity when faced with congestion charges, capacity is made available for those aircraft that are willing to pay the higher fees. In return, such aircraft experience less delay."[43] Therefore, if delay can be reduced by building a new runway, it can also be reduced by setting efficient congestion prices."

There is an important difference between congestion pricing and runway investment; congestion pricing does not cost very much to implement. In fact, it would be a fairly simple matter to replace current weigh-based fees with take-off and landing congestion charges during peak periods and with lower charges during off-peak periods (to achieve revenue neutrality). Runway investment, however, is costly and takes time. According to the Supplemental DEIS/Final EIR, construction costs for the proposed runway are estimated at $33,000,000.00,[44] and construction will not be completed (for the runway only) until sometime in 2004.[45] Although Massport sets up various alternatives and recommends building a runway as the preferred alternative, this is misleading because the alternatives are not evaluated according to a cost-benefit criteria, which is the accepted way to choose among competing alternatives. The inclusion of costs and benefits could make the preferred strategy less desirable than the congestion-pricing alternative, and therefore, Massport has failed to include such material facts and analysis.

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"The Supplemental DEIS/Final EIR suggests that although peak-period pricing does produce delay savings, they are less than building a runway (see, for example, Table 4.7-2 on page 4-75 of the Supplemental DEIS/Final EIR)."[46] However, this analysis is misleading due to Massport's manipulation of the sequencing. "If pricing were implemented first, followed by runway investment (i.e. the generally accepted sequencing), the benefits from pricing would be higher than if the sequencing were done in the reverse. That is, the marginal benefits from reduced delay from pricing are less after a runway is built than before a runway is built. Even where analysis calls for both pricing and investment, efficient prices are the first policy put in place."[47]

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[43] Id.
[44] Supplemental DEIS/Final EIR, Volume 2, page 6-179.
[45] Supplemental DEIS/Final EIR, Volume 2, page 7-24.
[46] *The Importance of Peak-Period Pricing at Logan.* Steven A. Morrison & Clifford Winston (May 2001). See Appendix G.
[47] Id.

One advantage of peak-period pricing at Logan is that its predicted effects are not likely to be subject to fleet mix. To a first approximation, commercial jets delay traffic as much as general aviation, thus congestion fees would not have to change if Logan experiences a change in its fleet mix. However, a runway investment could be sensitive to changes in fleet mix. "In the present case, Logan has proposed a 5000-foot runway expecting general aviation and commuter planes to use it, thus reducing delay. While the runway has been under consideration there has been changes in the fleet that uses Logan replacing turboprops with regional commercial jets that are too large to use the new runway. In this case, the benefits from the new runway would be overestimated because fewer planes would actually be using it than were originally predicted."[48] Given the changes and recent trend at Logan in regards to its fleet mix, the proposed 5000-foot runway would be a poor investment because regional jets are rapidly replacing the planes initially identified to use this runway, and moreover, 75 percent of the current regional jet fleet using Logan cannot use a 5000-foot runway. This is further supported by the fact that other 5000-foot runways[49] are not being used because they are too short to handle the new regional jet fleet mix.

B. The DEIS and the Supplemental DEIS/Final EIR are Technically Deficient.

The technical foundations for Massport's findings and conclusions are impossible to assess accurately. Massport claims to have analyzed peak-period pricing and its effects, but it is not clear how this was done. As previously stated, peak-period pricing should amount to optimal congestion changes which in turn depend on the value of passengers travel time, the demand for the airport, the sensitivity of demand to the take-off and landing charges, and the ease of passengers and airlines to fly at different times of day or to different airports. None of these parameters or values were included in the DEIS/R or the Supplemental DEIS/Final EIR. Moreover, the conceptual basis for peak-period pricing and how these prices were constructed was not discussed, so it is impossible to assess accurately what the findings are actually measuring. Similarly, without a detailed description of the model, its parameters, and assumptions, it is impossible to assess accurately the findings on the effects of building a new runway, including what, if any, delay reduction benefits a new runway would provide. 17.70

C. Logan Experience with Congestion Pricing.

Massport refuses to consider the effectiveness of congestion pricing as a delay reduction alternative to building a new runway.

[48] Id.
[49] Philadelphia and BWI.

In July 1988, Massport implemented the Program for Airfield Capacity Efficiency (PACE). PACE represented a modification to Logan's landing fee structure that redistributed costs between users, while maintaining revenue neutrality (i.e., maintaining total airfield revenues at a level that does not exceed total airfield costs). The landing fee formula was changed to include a $91 fixed cost per landing plus $0.45 per 1,000 lbs. As a result of PACE, the cost of using Logan increased substantially for smaller aircraft, and declined somewhat for larger aircraft. PACE was challenged by operators of small aircraft in US District Court and in an administrative proceeding before the US Department of Transportation (DOT). Summary Judgement upholding PACE was issued by the US District Court. However, the PACE fee structure was found to discriminate against smaller aircraft users by the DOT and, therefore, to be in violation of federal aviation statutes. The US Circuit Court of Appeals upheld the DOT. As a result, PACE was discontinued after only six months of use.[50]

During the six months in which PACE was in place the efficiency of Logan's operations dramatically improved. "In February 1989 – two months after the PACE landing fee was discontinued – Massport issued a summary of the PACE fee's remarkably favorable impact on Logan's operations:[51]

> 1. On-time performance at Logan was significantly improved. Not only did the percentage of on-time departures increase markedly, but also Logan's relative on-time performance rose steadily in comparison to the performance of other busy airports around the country. In September of 1987, when DOT started issuing "report cards" grading on-time performance at the nation's 27 busiest airports, Logan ranked 21st. In September of 1988, [Logan] had moved up to 12th; in October, [Logan was] 11th; in November [Logan] ranked 10th; and, by the end of December, when DOT ruled against PACE, [Logan] had achieved the astonishing rank of 2nd-best in the nation for on-time performance.
>
> 2. Commuter carriers carried slightly more passengers in slightly fewer flights on significantly larger airplanes. ... This action spread the cost of landing fees over more seats per trip, and reduced the number of flights on heavily traveled routes, thus improving the efficiency with which the commuter carriers used Logan's finite and valuable airfield capacity. Some carriers increased their fares in

[50] Supplemental DEIS/Final EIR, Volume 1, page 3-39.
[51] The following is an excerpt from the Conservation Law Foundations Comments on the DEIS/R.

response to the new fees, but the fare increases did not slow the growth of ridership.

3. Thanks in part to Massport's "Essential Air Service" Exemption Program, smaller commuter markets suffered no adverse consequences from the higher landing fees. . .

4. General aviation (GA) traffic at Logan declined by about one-third, but did not disappear. Since the per-hour cost of operating business jets and turbo-props has always been high, the PACE landing fee had no effect on this segment of the GA population at Logan, which continued to use the airfield with its accustomed frequency. Smaller, single engine aircraft did make less frequent use of Logan, although this change did not result in the "diversion" of traffic to Hanscom Field. Since travelers who used these small aircraft tended to be traveling within a 150-mile radius of Logan, and since most of them were using private planes to move to and from markets which were also served by scheduled commercial service, Massport staff correctly predicted that the users of these smaller planes simply switched over to scheduled air service or to some other mode of transportation. Perhaps the most interesting GA statistic is that *more than half of the private aircraft using Logan during the PACE fee period were traveling to or from points which offered scheduled air service.* In other words, general aviation is demonstrably more a tool of convenience and luxury than of necessity.

PACE Update, p.3. Both the Secretary of Transportation and the First Circuit stated in their decisions concerning PACE that a program with the substantive effects of the PACE program could be successfully implemented by Massport, if it was developed and implemented correctly."

In the Supplemental DEIS/Final EIR, Massport attempts to undermine the positive effects of PACE by stating that:

> "while many are under the misconception that PACE was effective because of the subsequent decline in Logan regional carrier and general aviation operations, this decline was experienced at other airports in the region and was more related to market factors than PACE."[52]

[52] Supplemental DEIS/Final EIR, Volume 1, page 3-39.

However, Massport fails to offer any evidence that this was in fact true.

Moreover in 1993 Massport, due to the high and increasing levels of delay at Logan, revised the PACE program to conform to federal law to reflect the decision of the Secretary of Transportation and the First Circuit.

In the modified approach, peak hour fees applied only to the most congested period of the day, and the method of airfield cost allocation was carefully calculated using the utility industry as a model. The resulting peak hour fee proposal had three components: (1) an operations charge for all aircraft irrespective of weight, (2) a weight based charge, and (3) a peak hour fee between 2:00 p.m. and 8:00 p.m. (for both landings and takeoffs). The proposal was designed to be revenue neutral, but the effect on individual users differed. Smaller aircraft would pay more than under the traditional method, and larger aircraft would pay less.[53] If this proposal was implemented it would reduce specific peak-hour flights by 10-17.5 percent,[54] which meant for passengers a 40 to 70 percent reduction in delays.[55]

Contrary to what Massport asserts, congestion pricing would offer a substantial and immediate benefit to travelers, and the Commonwealth as a whole. Traveler would benefit from substantially less delays and the use of larger, safer aircraft, while the Commonwealth would benefit from avoiding the cost of a usable 5000-foot runway. Moreover, congestion pricing would result in immediate benefits to travelers, the Commonwealth and the environment.

The Secretary should find that Massport omitted material facts, and therefore should require Massport to file a new ENF. Alternatively, the Secretary should find that the Supplemental DEIS/Final EIR inadequate based on its failure to include an accurate and complete analysis of peak period pricing, its failure to include facts material to this analysis, Massport's inclusion of false information, and its failure to respond to the specific requirements of the Secretary's certificates, and require Massport to file a Supplemental Final EIR, compelling Massport to conduct an indepth, comprehensive cost-benefit analysis of each proposed capital investment, including Runway 14/32, in comparison to each congestion pricing variation and operational management alternative; compelling Massport to redo its analysis of Peak-Period Pricing, by using the standard analysis of implementing Peak-Period Pricing first and then consider investment options; and compelling Massport to disclose a detailed description of the model,

[53] Supplemental DEIS/Final EIR, Volume 1, pages 3-39 and 3-40.
[54] Conservation Law Foundation Comments to the DEIS citing Massachusetts Port Authority, "Logan Airport Peak Hour Pricing" (Apr. 1993); Arthur D. Little, Inc., for the Massachusetts Aeronautics Commission, "Strategic Assessment Report – Final Report," p. 4-42 (July 1993).
[55] Id.

its parameters, and assumptions, so that it will be possible to assess accurately the findings on the effects of building a new runway, including what, if any, delay reduction benefit a new runway will provide.

2. TRUE REGIONAL TRANSPORTATION SYSTEM

Massport's treatment and analysis of regional transportation was inadequate. Secretary Durand, in his Certificate of Compliance issued for this project's Draft Environmental Impact Report, underlined the significance of the regional planning context as an influencing factor in his deliberations by noting it as the first of the three principal issues to "shape the preparation and review of the Final EIR for this project". We agree with Secretary Durand that the regionalization of New England's air transportation network holds unique promise as "a solution to problems of congestion and delay at Logan." Further, regionalization offers both near and long term solutions to the region's demand for air travel by providing:

- Less congested, more affordable access to a wider variety of air transportation options;
- Wider geographic distribution of economic development benefits associated with airport operations and activities; and
- More equitable distribution of the environmental externalities associated with air transportation services.

We do not support Secretary Durand's assertion, however, that "Massport's treatment of this subject in the Draft EIR has been (sufficient)" and we conclude that his reliance on Massport to address these issues in the Final EIR has been sadly misplaced. The Final EIR has failed to adequately remedy the gaps in the accuracy, quality and depth of Massport's analysis of the regional air transportation network and its effects on Logan operations and the regional air transportation market.

A. <u>The regionalization analysis presented in the Draft EIS/R and the Supplemental DEIS/Final EIR was inadequate.</u>

We maintain that the regional analysis presented in the Draft EIS/R and Supplemental DEIS/Final EIR omit and misrepresent information and facts necessary to adequately and accurately analyze the effects of regional transportation. Specifically Massport:

- Erroneously dismisses the direct connection between the effect of regional air transportation decentralization and the conditions that Massport cites in its effort to justify the construction of additional airside capacity;
- Misrepresents the service area for Logan Airport, in order to overestimate future demand and omits an analysis of the market share that regional airports service from areas assumed to be supported solely by Logan airport;
- Misrepresents and underestimates the potential diversion of future air transportation market share from Logan to regional airports;
- Presents no tangible evidence of serious, concerted support for continued regionalization and, in fact, shows evidence of infrastructure investment designed to enhance the dominance of Logan Airport in the regional transportation network; and
- Omits an analysis of the tangible regional economic benefits associated with decentralized air transportation services development, particularly in comparison to the highly concentrated benefits associated with the construction of the Preferred Alternative.

B. The Relationship of Regionalization to the Preferred Alternative.

In the Supplemental DEIS/Final EIR, Massport repeatedly attempts to unlink the effects of regionalization from the justification to add additional runway capacity in the form of the Preferred Alternative. One such representative comment is:

> "While regional airports and rail are essential elements of a balanced and efficient inter-city travel network, they cannot relieve Logan delays that occur in specific weather conditions because of a shortcoming in the airfield geometry."[56]

We agree that regional transportation policy cannot change the weather, as this sentence speciously and sarcastically notes, but we steadfastly deny that delays manifested in northwest wind conditions cannot be relieved by regional transportation policy that alters the overall demand for air transportation services out of Logan Airport. As Secretary Durand himself notes in his Supplemental DEIS/Final EIR Certificate,

> "...I am not convinced that the preferred alternative is purely a capacity neutral airfield enhancement, as stated by Massport. While the maximum 'capacity' of the airport will remain at 120 operations per hour with or without the airside improvements, the construction of Runway 14/32 will allow Logan to operate at or near 120 operations per hour **for a greater proportion of the year than it**

[56] Supplemental DEIS/Final EIR, Volume 1, page 2-3.

currently does....there may well be some latent demand generated by the airside project." (emphasis added)

This is not a question of pure geometry. It is a question of supply and demand. Alternative, competing regional transportation options will affect the supply and demand of specific classes of air service that ultimately utilize, to a greater or lesser degree, the physical assets of Logan Airport.

The degree to which air transportation is decentralized in the region will determine the degree to which Logan assets will be utilized. This is the reason that Massport seeks to disjoint efforts to enhance regional air capacity at the expense of Logan Airport from what they characterize simplistically as a "shortcoming" in airfield design. This is also the reason that it is important to ensure a fair, professional and accurate analysis of our regional air transportation future within the environmental review process for this project, and not in the context of an ambiguous, irrelevant, multi-agency study, as is recommended by Massport. This is simply a method to delay true regional air transportation investment.

C. Massport misrepresents the demand for Logan Airport services.

The demand for airline services can be expressed by many metrics, i.e. dollar per seat, mile by route, by type of passenger, by purpose, etc. These metrics are primarily used in a corporate context. In regional terms, demand for commercial seats is affected by the costs associated with congestion, often expressed as a function of time costs, tolls (costs imposed to control congestion) and other transaction costs. In the aggregate, these factors reconcile the demand for alternative air transportation choices and, in certain markets, the choice of air travel over alternative modes of transportation. In all of these choices, however, the demand for air services is defined by the behavior of people within a market defined by human behavior. Although this simple statement may seem syllogistic, it nevertheless describes a non-trivial flaw in the logic associated with Massport's definition of "market" demand for air services.

Massport does not base their demand calculations – the foundation for all of the logic underlying their justification for the Preferred Alternative – on the behavioral choices driving use of **all** transportation options in the region; rather they base all of their demand characteristics on samples of passengers **using Logan**, and segment the percentage of Logan users according to concentric circles around their facility as a proxy for "demand". The 100% market share of **Logan users** is divided into segments of passengers originating from the City of Boston; within the 128 area; and from the rest of the State. Massport

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illogically, tautologically represents the "power" of the draw of Logan as the proportion of **Logan users** drawn from within Route 495. It is left to our conjecture the proportion of total airline travelers within any of these areas who, alternatively, are drawn to other airports (and airline seats) for airline services, and for what reasons.

Massport best makes the distinction itself. In their Draft EIR, Massport states:

> "The boundaries of the geographic area from which Logan draws origin-destination traffic is determined by the quality of service at Logan as well as the proximity of other airports and the level of services they offer."[57]

This is defensible. However, Massport then states:

> "Logan's demand is highly concentrated within the Metropolitan Boston area. In 1996, 78 percent of Logan's origin-destination **passenger demand** (emphasis added) was drawn from the region within the Route 495 beltway...."[58]

Taken together, these statements are willfully intended to suggest that 78% of the total airline demand within the Route 495 is, in fact, satisfied by Logan Airport. This is not true.

In simple terms, this construct does not represent either:

1) All passenger demand within this area; or
2) An accurate, defensible definition of the appropriate area in which demand for Logan's airport services can be asserted to be predominant.

Regardless of these inconsistencies, the dye is then cast to represent the area within Route 495 as the "core service area" for Logan Airport – a meaningless term to support a meaningless statistic. The Final EIR restates this error in more awkward terms:

> "..because of its proximity to the greatest concentration of travel demand in the region, Logan is the primary airport for passengers originating within Route 495. Logan is the best airport for serving the majority of the air travel needs of these passengers."[59]

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[57] DEIS/R, Volume 1, page 2-7.
[58] DEIS/R, Volume 1, page 2-7.
[59] Supplemental DEIS/Final EIR, Volume 1, page 2-10.

This is the "big lie". There is not a scintilla of evidence presented to document or confirm these bold, inaccurate assertions. Indeed, Massport itself in its Draft EIR states that

> "passengers will generally use the closest airport, provided that all nearby airports offer the same level and quality of airline services."

The words "proximity" and "closest" require further explanation. Geographic distance is a poor proxy for the time and inter-modal transfer costs that affect consumer behavior in the demand for airline services. Demand models for Logan and the regional airports should be constructed according to the costs of travel along the major routes by which these facilities are accessed – primarily the "spine roads" linking the metropolitan core to outlying suburbs and other metropolitan area cities. These would include the Massachusetts Turnpike, Route 95S, Route 93, and Route 95N, amongst other roads providing access from the interior of the Route 495 ring to outlying regional airports. The costs of accessing regional airports are much smaller than they are for accessing Logan Airport at a distance along these spines far within the "core service area" Massport claims as Logan's own. This factor has a significant effect on demand for the entire bundle of air transportation services. Parenthetically, we would also posit as a reasonable hypothesis that the cost of access to Logan is much higher than access cost for T.F. Green for the entire Cape Cod region.

In general, it is our contention that a competent, professional air transportation demand study would show that significant market share is currently diverted and can continue to be effectively shifted from this so-called "core service area" to regional airports. Again, this is the shortcoming of basing a "demand" study on observations of a limited subset of regional traveler behavior utilizing one facility, as opposed to a study in which consumer behavior as a whole is evaluated.
We should note that we agree with the Massport that, at the present time, not all services offered by Logan are offered by regional airports. But for many existing services, and especially the medium haul and large non-business discount fare market segments, the closest air facilities to the overwhelming majority of residents within the Route 495 ring are, in fact, the regional airports – not Logan Airport.

The key to growth in providing air transportation services that continue to shift the geographical parameters of demand lies largely in the action of the airlines and their ability to schedule departure seats that match the requirements of the regional market, as well as the enabling infrastructure and service investments in airport facilities. T.F. Green and Manchester Airports are now the fastest growing

airports in the country, largely because of the introduction of discount competition.

Massport concedes that new passenger market share for short and medium haul traffic is now dominated by the regional airports, and a true demand study would also indicate that Logan's existing market share is also being lost. In suggesting, however, that Logan can never relinquish it's role as a provider of scheduled seats for long-haul market, Massport ignores market studies that show that the majority of new passenger demand for long-haul services is also captured by regional airports.[60] This arbitrary assertion should further indicate that the "demand" calculations supporting Massport's request to increase capacity are faulty.

This growth has been supported by active airport authorities, sympathetic government and business interest, and the commitment to investment possibilities with such consensus. The continuing shameful under-utilization of Worcester Airport, most recently under the governance of Massport, stands in stark contrast to these success stories and is particularly discreditable in light of the traffic it historically has shown it can support. As Massport itself states:

> "Past experience (*sic*) demonstrates that the regional airports can recapture traffic from Logan through air service development..."

The Secretary should that Massport knowingly omitted material facts, and therefore should require Massport to file a new ENF. Alternatively, the Secretary should find the Supplemental DEIS/ Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to design, complete, and approve a professional transportation demand study to evaluate business and consumer demand for regional air transportation services and alternative modes of transportation; compelling Massport to prepare and evaluate an accurate, trustworthy, updated and professional forecast of service area allocation; and implement a timely independent, regionally neutral assessment of the Commonwealth's transportation requirements and support the implementation of an efficient and just regional air transportation network.

D. Massport's misrepresentation of the potential diversion of future market share from Logan to Regional Airports and inter-city rail transportation.

Massport currently estimates that, by 2010, 7.3 million of the 37.5 million passengers forecasted to demand services provided by Logan Airport will be

[60] *See* Figure 2.3-2 on page 2-22 of the Supplemental DEIS/Final EIR. This shows that 51% of new passenger demand for long-haul services is being captured by regional airports.

diverted to other regional alternatives. Of this 7.3 million diverted passengers, Massport:

> "...estimates that the regional airports could *recapture* as many as 3.4 million passengers from Logan."[61] (emphasis added)

We contend that the methods used to calculate these projections systematically undercount the true number of passengers that will be diverted from Logan Airport. Hence, we contend that the demand for Logan Airport services is significantly overstated and the benefits of the proposed Preferred Alternative are chimerical.

First, these estimates are based on passenger demand studies undertaken in 1994 (the so-called NEC Study). Using such outdated passenger behavior data and service area definitions as a baseline from which to extrapolate changes in demand behavior that have occurred even to this year – not to mention 2015 – is not an acceptable professional practice. This data has not changed in consideration of the significant changes that have occurred in all the components of demand discussed above in paragraph 6, including, most significantly, changes in scheduled airline services, but also changes in airport facility accessibility, convenience and service.

Second, the primary methodological structure is focused on the notion of service area "recapture", as noted in the quotation leading this section. The theory behind this method is based on the supposition that the **only** passenger traffic that will be diverted to regional airports are passengers in the existing service areas (undefined) of the regional airports that drive to Logan Airport to utilize its services. "Recapture" is the phrase used to describe the diversion of passengers from their **own** regional service areas to the regional airports.

One can easily quibble with the estimation methods employed to project such "recapture" as presented in the Draft EIR (Table 2.4-4). The most egregious example of guesswork masquerading as cold, hard fact is the "recapture rate" set for each regional airport, and particularly that for Worcester – 16%. A recapture rate that low for a regional airport under Massport's management gives scant reassurance that Massport's management possesses any confidence in their own ability to make this facility a key component of the regional mix.

The real difficulty with the concept of recapture is that it totally ignores the continuing diversion of passengers to regional airports from **Logan Airport's own service area** – presumably those areas in the region which are not explicitly

[61] Draft EIS/R, Volume 1, page 2-22.

included in the 1994 regional airport service areas utilized for the baseline analysis. As shown in the prior paragraph, market share from Logan itself continues to drain to the regional airport system. The "core service area" within the 495 ring that Logan misleadingly defines for itself as a sole source of demand is, in fact, highly susceptible to encroachment from airline services offered at Manchester, Worcester and T.F. Green. Massport itself concedes that the great majority of new passenger growth in all markets served by Logan, Manchester and T.F. Green is being served, not by Logan, but by the regional airports.[62] Assuming that this new passenger growth is not solely generated from the Providence, Worcester and Manchester service areas, this implies significant uncounted passenger diversion from Logan to the regional airports is now occurring and growing at a growing rate. **These passenger diversions are not accounted for in the methodology, nor are they accounted for in the methodologies used to generate the baseline Logan service area demand forecasts now being pushed further into the future**.

Since this underestimate directly affects the number of projected airport operations used by Massport in their defense of the Preferred Alternative, we respectfully request that the Secretary determine that the Supplemental DEIS/Final EIR is inadequate. We further request that the Secretary order Massport to provide a Supplemental Final EIR with an expanded scope to include an accurate, trustworthy, updated and professional forecast of service area passenger allocation and evaluation.

E. Massport presents little evidence of effective regional decentralization investment.

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The degree to which regional airports will continue to capture increased market share from Logan Airport is dependent on the level of airline services made available at the competing facilities, coupled with investment in improving the accessibility of airport facilities through transportation improvements that reduce travel time, congestion and inter-modal transaction costs for the airport market. Although Massport is in a unique position to be able to influence both of these factors, it is more capable of directly affecting the development of infrastructure to support continued decentralization of airport services.

Massport justifiably suggests that their direct role in this process is limited to "the development, operation, or use of infrastructure at…Logan, Hanscom Field and Worcester Regional…" and characterizes its role in the diversion of passenger demand as primarily one that "focuses on cooperative planning with other airports

[62] *See* Figure 2.3-2 on page 2-22 of the Supplemental DEIS/Final EIR.

and agencies."[63] Although Massport claims it is "promoting the use of regional airports and travel modes to provide relief to Logan Airport", the facts presented in the Supplemental DEIS/Final EIR contradict this assertion.

Massport shows a pattern of investment that clearly favors the improvement of passenger access to only Logan Airport, including:

- The implementation of a single inter-modal air transport transfer station – the so-called AITC – serving only Logan Airport. A credible demand diversification strategy would distribute such centers throughout the region, connecting Metropolitan Area passengers with all regional airport centers. Not even a connection to Worcester is planned;
- The implementation of a new, fourth Logan Express in the North Shore, explicitly serving market areas that directly compete with Manchester airport. This is not an example of a cooperative planning effort with other airports; and
- The proposed construction of a rail link providing access from downtown Boston to T.F. Green. This high-cost, low volume, Boston-centric transportation project will take many years to complete, yielding benefits that, today, could be realized through the cooperative development of bus services modeled on the successful Logan Express program. The scope and scale of this project is clearly not pertinent to the immediate needs for improved intra-regional transportation investment that Massport purportedly supports.

Finally, we note that, despite the commitment that the City of Worcester and the FAA have made for the development of future air services at Worcester Regional, we do not believe that Massport has indicated through its planning agenda or investment schedule an interest in sincerely developing this facility to its highest and best potential. Although Massport has fulfilled in some small part its role as a promoter of airside services at Worcester Regional, the agency has shown little interest in promoting needed highway improvements or the integration of this facility with other regional transportation assets.

F. Massport omits the tangible economic benefits of a decentralized regional airline transportation service.

17.73

Although not a specific condition cited in the Secretary's scope relative to the Draft EIR, an analysis of the specific economic benefits of decentralized airline service development should be a component of the Final EIR. The benefits associated with the construction of the Preferred Alternative would accrue primarily to an economic base already supported by extensive construction

[63] Supplemental DEIS/Final EIR, Volume 1, page 2-49.

activities in the immediate Boston area, as well as a retail and services market consisting of over 27 million passengers per year. This market already provides employment for 15,000 people at Logan Airport by Massport's own estimate.

Distributional justice is a principle related to the concept of environmental justice; the distribution of economic benefits related to a decision of regional consequence should accrue as equitably as possible across the entire region and not only to a small, favored section of that region. In a sub-regional market economy where infrastructure development may serve as one of few "economic engines", the marginal net benefit on one additional dollar spent on construction or services development is far greater than an identical investment in an economic area in which many larger investments are already at work. This is true in terms of direct employment and consumption, as well as the even more significant multiplier effects attributable to direct investment.

It is shortsighted and myopic for Massport to count as economic benefits only what we believe to be the inflated economic benefits of delay reduction. In promoting the Preferred Alternative over investment in improving regional transportation services, Massport promotes an economic development policy that hinders the development of the state economy as a whole. We believe that this is inequitable and unfair.

G. As a result of the omissions and misleading information presented by Massport the Secretary should determine that the Supplemental DEIS/Final EIR is inadequate.

The flaws inherent in Massport's regional analysis in the Supplemental DEIS/Final EIR are numerous and troubling. The dismissal of the connection between regional demand issues and airport capacity adjustments is perfunctory and logically inconsistent. The methodologies employed in estimating service areas and demand for airline services are not only fatally flawed, but also are misleadingly and fraudulently presented to the lay reader. The misrepresentation of Logan-oriented transportation infrastructure investments as investments that hallmark Massport's support of true regionalization is both obvious and embarrassing.

The Secretary appears to accept these deficiencies as acceptable. If, as it is suggested in his comments, his acceptance is predicated on the notion simply that it is not necessary to re-examine regional issues because the issue of a second major regional airport is dead, then he is missing the most significant connections between this component of the report and the conclusions leading to the Preferred Alternative: regional passenger demand and the effects of such demand on the number of airport operations at Logan. Simply stated, Massport has significantly

overestimated future regional demand for Logan airside services, for the reasons detailed above. Such overestimates have led to seriously overstated assumptions regarding the demand for Logan airport operations, in order to justify the construction of Runway 14/32 and increase capacity at Logan in the face of dwindling market share.

We respectfully request that the Secretary determine that the Final EIR is inadequate and order Massport to submit a Supplemental Final EIR with an expanded scope requiring Massport to implement a truly independent, regionally neutral assessment of the Commonwealth's transportation requirements and a specific detailed plan to create an efficient and just regional air transportation network, including, but not limited to, a specific detailed plan to maximize diversion of passengers within 495 from Logan to the regional airports.

3. ADVANCED NAVIGATIONAL TECHNOLOGY NOT CONSIDERED

A. Massport has failed to adequately consider advanced navigational procedures for Runway 33L, which could mitigate the environmental impacts over the South Shore.

Logan Airport is ideally suited for the implementation of a required navigation performance (RNP) area navigation (RNAV) curved approach to Runway 33L with a later conversion to the Global Positioning System. Both the curved RNP RNAV and a straight-line angled approach are instrument approaches that can be implemented using existing technology. Furthermore, Massport has failed to consider future developments in GPS using a wide area augmentation system (WAAS) or a local area augmentation system (LAAS), which will be available in the United States by 2003-2004, and will improve efficiency in landings by offering increased vertical accuracy. Benefits of GPS/WAAS and GPS /LAAS are currently being achieved in Europe through the implementation of the microwave landing system (MLS).

Implementation of advanced navigational technology will assist in reducing environmental impacts by permitting aircraft to come in over water, and by reducing the flying distance to the airport when Runway 33L is in use, as well as allow airspace planners to extract more capacity out of Logan without building a new runway. 17.74

The Secretary should find that Massport omitted material facts, and therefore, require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplement Final EIR with an

expanded scope compelling Massport to address the environmental benefits and delay-reduction benefits that can be achieved through the use of advanced navigational technology.

III. MITIGATION.

Massport's proposed mitigation programs are inadequate. Until Massport submits a Final EIR that is adequate, and the true environmental impacts are known, it is pointless to consider Massport's proposed mitigation programs, because any reviewer of the Supplemental DEIS/Final EIR is fundamentally unable to understand what the true nature and extent of the impacts of the Preferred Alternative, and therefore is precluded from knowing the identity of those impacts, which would be the subject of any mitigation analysis.

Furthermore, Massport has demonstrated historically that it ignores its promises and commitments in the past. Massport has demonstrated a total disregard for any mitigation program which has been proposed or which they have agreed to, if, in their subjective determination, such mitigation is inconvenient or does not contribute to Massport's own conception of its core mission. For example:

- Massport has stipulated and agreed to a court order not to build any more runways at Logan, yet Massport not seeks to breach this Agreement and proceed with runway construction; 17.75

- On March 14, 1980 the Federal Aviation Administration (FAA) issued a Record of Decision (ROD) pertaining to Runway 22R departures at Logan. This decision mandates that turbojet aircraft departing Runway 22R fly a 100-degree compass heading until 5DME from the BOSTON VORTAC. This procedure was selected from six options that weighed operational feasibility and safety, noise impact, economic effects, energy consumption, air quality effects and induced socio-economic effects. However, the Standard Instrument Departure shows that this agreement is being violated and that pilots are instructed, when departing Runway 22R, to turn left heading 140 degrees, minimizing the benefits of the 1980 ROD; and 17.76

- Although Massport agreed to adopt PRAS, PRAS goals have not been achieved, and historically have not been implemented by controllers. 17.77

Any component of the Project that is not subject to regulatory compliance and enforcement cannot be presumed to effectively mitigate impacts of the Preferred Alternative. Moreover, any mitigation efforts proposed are illusory if:

1. Massport does not have the authority themselves to approve and/or implement the mitigation program;

2. Massport's implementation is dependent upon approval or participation by another authority (e.g. FAA, airlines, any government agency); or

3. Adequate funding is not already in place.

Mitigation measures can only be relied upon if they are an absolute precondition to Massport's implementation of its Preferred Alternative. Therefore, prior to construction, and as a prerequisite to further consideration of Proposed Runway 14/32 we urge the Secretary and Administrator to require Massport to:

1. Cap the growth of Logan; 17.78

2. Limit Logan to provide only long-haul and international services, requiring all other passengers to use other regional airports and alternative modes of transportation; 17.79

3. Soundproof all buildings and structures that fall within the 55 dB DNL contour;

4. Develop and implement a plan to direct passengers within Route 128 and Route 495 away from Logan and to other regional airports; 17.80

5. Limit landside growth at Logan. Restrict the construction of additional gates, implement parking restrictions and perform a comprehensive short-term and long-term cumulative delay study on access to terminals; access to gates within terminals; as well as other airside delays; 17.81

6. Ban all nighttime flights from 11:00 p.m. to 6:00 a.m.; 17.82

7. Implement peak-period pricing, then fully analyze the delay-reduction benefits of peak-period pricing;

8. Configure flight paths so that more departures and arrivals on 33L, 4L and 4R do not impact residential communities as follows:

   - Implement RNP[64], RNV[65] curved approach which would keep the aircraft over the water minimizing the noise impacts near the airport and reducing the flying distance to the airport when Runway 33L is in use, and minimizing environmental impacts on all communities.

9. Implement the 1980 ROD to reduce impacts to the South Shore by causing more aircraft to take off over the water, using a 100 degree compass setting when departing Runway 22R.

[64] Required Navigation Performance.
[65] Area Navigation Approach.

10. As an alternative to taxiway improvements, implement "push back" requirements to eliminate the warehousing of aircraft on taxiways to reduce the air pollution and noise impacting the communities surrounding Logan.
11. Move all dedicated freight operations to another airport. 17.83
12. Conduct an independent analysis and assessment of environmental and delay reduction impacts of a no growth alternative for Logan.

IV. FAILURE TO ADEQUATELY RESPOND TO COMMENTS

1. SECRETARY'S COMMENTS

Pursuant to 301 CMR 11.07(l) of the MEPA Regulations the Final EIR shall include "a response to the certificate of the Secretary on the previous review document and each comment received on the previous review document, provided that the subject matter of the comment is within the Scope…". Massport has failed to adequately address the Secretary's Scope. Set forth below is a chart detailing Massport's inadequate response to the Secretary's comments. Massport's failure to adequately address the comments of the Secretary is a serious violation of MEPA/NEPA regulations.

SECRETARY'S 1999 CERTIFICATE

ISSUE	SECRETARY'S SCOPE	COMMENT
Regional Transportation	In the Final EIR Massport must study the planned improvements at Worcester, Manchester and Providence in greater detail to show the effects upon passenger traffic at Logan…Potential commitments or mitigation relating to regional transportation include: ▪ Improved ground access to Worcester ▪ Widening of Rt. 3 to the NH border to improve access to Manchester Airport ▪ Funding construction of a rail station at Providence Airport ▪ Implementation of the Urban Ring to improve transit access to Logan.	Massport's response is inadequate. The Final EIR has failed to adequately remedy the gaps in the accuracy, quality and depth of Massport's analysis of the regional air transportation network and its effects on Logan operations and the regional air transportation market. In the Supplemental DEIS/Final EIR, Massport repeatedly attempts to unlink the effects of regionalization from the justification to add additional runway capacity in the form of the Preferred Alternative. Although Massport claims it is "promoting the use of regional airports and travel modes to provide relief to Logan Airport", the facts presented in the Supplemental DEIS/Final EIR contradict this assertion. Massport shows a pattern of investment

		that clearly favors the improvement of passenger access to only Logan Airport, including: ▪ The implementation of a single inter-modal air transport transfer station – the so-called AITC – serving only Logan Airport. A credible demand diversification strategy would distribute such centers throughout the region, connecting Metropolitan Area passengers with all regional airport centers. Not even a connection to Worcester is planned; ▪ The implementation of a new, fourth Logan Express in the North Shore, explicitly serving market areas that directly compete with Manchester airport. This is not an example of a cooperative planning effort with other airports; and ▪ The proposed construction of a rail link providing access from downtown Boston to T.F. Green. This high-cost, low volume, Boston-centric transportation project will take many years to complete, yielding benefits that, today, could be realized through the cooperative development of bus services modeled on the successful Logan Express program. The scope and scale of this project is clearly not pertinent to the immediate needs for improved intra-regional transportation investment that Massport purportedly supports.
Peak Period Pricing	In the Final EIR Massport must enhance its study of PPP, including a tightly crafted exemption that will protect the greatly affected communities from losing connections to the national air network.	Massport's response is inadequate. Massport's overall analysis of PPP is insufficient because there does not appear to have been any cost-benefit analysis done, and also Massport did not make a fair presentation of PPP because rather that doing their analysis with PPP being implemented first, then the runway, they mislead the public into believing that the runway will serve to reduce the greatest hours of delay. In specific regards to this comment, although Massport further elaborates its discussion of the communities that could be affected by the implementation of PPP, they fail to describe the model or the data so that it can be analyzed nor

		does Massport respond to the secretary's request for a tightly crafted exemption for local carriers instead of using variable PPP fee projections Massport uses only limited flat fee scenarios (include language in delay letters).
Peak Period Pricing	Massport must seek FAA approval for a PPP program as soon as it yields real benefits.	Massport's response is inadequate. Massport's overall analysis of PPP is insufficient because there does not appear to have been any cost benefit analysis done, and also Massport did not make a fair presentation of PPP because rather that doing their analysis with PPP being implemented first, then the runway, they mislead the public into believing that the runway will serve to reduce the greatest hours of delay. The implementation of PPP would provide immediate relief (as opposed to waiting for a runway to be built) and it may provide a significant amount of relief so as to conclude that no investment is needed (i.e. no need to build the runway). Massport also fails to describe the model or the data it utilized so that it can be analyzed and validated. Massport's failure to respond to this request in good faith clearly indicates that PPP must be implemented first and not simply suggested in as a mitigation measure.
Air Emission Quality	In the Generic EIR Massport must develop a system of market-based revenue-neutral landing fees which would reward cleaner planes with lower charges on the principle that "the polluter pays".	Massport's failure to identify, analyze and evaluate air emissions for its Preferred Alternative 1A, as well as its failure to adequately address other air emissions issues is so fundamental and so indicative of Massport's disregard of air quality regulations that placing this issue in the GEIR merely assists Massport in its continued evasion of Section 61 requirements. Furthermore, it is naïve to believe that Massport will pursue such polluter pays system in good faith when its failure to adequately consider peak period pricing or the external economics of noise and emissions demonstrates its willingness to protect the polluter from financial accountability.
Cumulative Airside Improvements	Massport argues that the impacts of the airside improvement projects are limited because it does not increase the capacity of the airport, or stimulate future demand. The Secretary disagrees. In the final EIR Massport must	**Massport failed to comment on this issue raised by the Secretary's Certificate.** Contrary to Massport's misleading assertions and analysis the airside improvement project will significantly expand Massport's capacity. Allowing

	specify a series of enforceable short-term and long-term mitigation measures, all intended to make the neighboring communities quieter, cleaner and less congested Massport must also address Logan's cumulative impacts in the Generic EIR.	Massport to address this issue in two separate EIR procedures and a GEIR process is further evidence of the exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements. The public should be entitled to review one document on the entire project, so that they can fully understand the short-term and long-term and cumulative impacts of the entire project. Massport cannot adequately address all possible, reasonable mitigations because it has not adequately addressed noise, air emissions and other environmental impacts on a short-term, long-term and cumulative basis..
Ground Transportation/Access to Logan	In the Final EIR and/or the Generic EIR Massport must work with the MBTA to improve access to Logan via the Blue Line and the Airport Intermodal Transportation Connection.	The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements. The public should be entitled to review one document on the entire project, so that they can fully understand the short-term and long-term impacts of the entire project and other regulatory and permitting authorities have the right by law to have such measures in Section 61 findings.
Noise	In the Final EIR and/or the Generic EIR Massport must work with the FAA to limit the use of noisier "hush-kitted" aircraft.	The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements. Although Massport comments on its intended efforts to reduce the use of hush-kitted aircraft and substitute full Stage 3 aircraft, there has been no movement towards this and such a movement would have little chance of success given the historic opposition of the airline industry and its supporters in government. Moreover, Massport manipulate and misrepresent their noise data using Stage 3 aircraft rather than hush-kitted Stage 2 when it appears the trend at Logan is the continued use of Stage 2 hush-kitted air craft.
Air Quality	In the Final EIR and/or the Generic EIR Massport must set numerical targets for converting ground service equipment to clean fuels.	The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements and an attempt to evade the MEPA substantive standard as set forth in EIR Section 61 findings.
Noise	In the Final EIR and/or the Generic EIR Massport must provide more accountability for FAA compliance with the PRAS goals, which are intended to distribute aircraft noise more equitably among affected	The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements. Massport has failed in the past to keep their promises and commitments regarding actual

	communities.	accountability for FAA compliance. For example, historically PRAS has not been complied with, and the CAC does not agree with PRAS. Moreover, there is a 1980 Agreement with the City of Quincy to have planes take off at 100 degrees heading out over the water rather than over Quincy, however the reality being that in the Standard Instrument Departure, the FAA flagrantly violates this agreement by routing air traffic on a 140 degree heading which results in the air traffic controllers neglecting to turn the aircraft away from Quincy to go over the water. Accordingly, it is improbable and contrary to established practice that PRAS would have any validity or ever be implemented. Furthermore, PRAS has not yet been defined sufficiently to be enforceable and would, therefore, compliance would not be subject to any objective standard or verification.
Noise	In the Final EIR and/or the Generic EIR Massport must continue to implement and extend its residential sound proofing program, to ensure full access for all residents who are entitled to its benefits.	The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements. Moreover, the use of the 65 dB DNL is too high, only the FAA and DOD suggest 65 dB is acceptable. Also according to an August 2000 GAO survey of the nation's 50 busiest commercial airports, 70% of airport noise complaints come from individuals in areas outside of the 65dB DNL contour. Massport should redo noise figures using 55 dB and 45 dB. Massport also should redo noise contours for over 1000 feet AGL. In addition, Passport should redo noise contours using true and correct data to ensure that all eligible homes are included (i.e. data regarding Hull) and redo data using realistic fleet mix. Once noise impacts are actually calculated a specific plan with earmarked funding should be developed for soundproofing houses, schools and other structures within the appropriate 65, 60, 55, 50, 45 noise contours in the Boston Metropolitan Area.
Delay	Massport argues that the Preferred Alternative is intended solely to alleviate taxiway and northwest wind delays, and to maximize the operational efficient of Logan as passenger levels increase. Massport argues that the airside improvements will accommodate existing and	Massport's response is inadequate. While parts of Massport's analysis and some assumptions are disclosed, they are often disclosed in separate documents representing work done at different time periods with subsequent adjustments. In addition Massport never fully discloses the inner workings used of the models

	projected demand not generate additional demand. The Secretary disagrees that the Preferred Alternative is capacity neutral. Therefore: ▪ The Final EIR must thoroughly explain and justify Massport's delay modeling ▪ Explain the differences between Massport, FAA and DOT models of calculating delays and discuss any implications for environmental analysis Any information on delays should be presented in quantitative terms and compared over time from at least 1993 for Logan and other major US airports.	they use. Furthermore, no where in the DEIS/R or SDEIS/FEIR is there a concise description of the key assumptions made about the capacity under the various configurations, how aircraft are assigned to operate on specific runways when these configurations are in use, and hoe the resultant delays, if any, have been estimated. Massport makes reference to two models, FLAPS and DELAYSIM, which they use in their analysis. However the DELAYSIM model simulates how controllers assign aircraft to runways under specific weather conditions and with specific objectives for meeting goals under PRAS for Logan. Nowhere is the proportion of such operations assigned to each runway disclosed or is the methodology by which this is done. Rather, all that is contained in the documents produced by Massport are the results of such assignments. While Massport provided some data on airport configurations and nominal capacities are presented, they are from 1995. In addition, these data are manipulated within the DELAYSIM model to reflect controller compliance with PRAS, and one cannot relate the specific inputs to outputs produced in terms of delays, runway utilization and so forth.
Delay Model	The Final EIR should clarify the base case year, 1993, used in the delay analysis (and in other areas such as noise and emissions). If 1993 was indeed the base year the Final EIR should include a "sensitivity analysis" using a more recent year or an average of several years as a baseline and evaluate the effect on the report's conclusions.	Massport's response is inadequate. Massport picked another high year of delay, why not use 1999 actual data that was available because it better reflects impacts of regionalization. Also historical conditions used are not actual historical conditions but "modeled" historical conditions. Also although present actual data they do not reanalyze data. What about a No Growth Alternative?
Regional Transportation	The Final EIR must significantly expand upon its analysis of the effect of regional transportation ▪ Massport must report on the current status of ground access improvements to all 4 airports proposed by the MA state transportation agencies including projected dates for completion of studies and/or construction.	Massport's response is inadequate. Massport concludes that even with high utilization of regional airports and high-speed rail it will not reduce Logan's demand to levels that would solve Logan's delay problems. Massport fails to consider that once these airports and rail alternatives become more accessible it actually could leave Logan with just the international, long haul and limited

		commuter passengers. Massport fails to consider a No Growth Alternative at Logan. The New England Airports System Study is intended to evaluate the impact of recent regional airport developments on Logan, identify constraints to regional airport growth and highlight strategies for optimizing New England's regional aviation system. Before concluding that regionalization is not an answer (combined with alternatives that have less of an impact on the environment) this study should be completed. Moreover, although Massport claims it is "promoting the use of regional airports and travel modes to provide relief to Logan Airport", the facts presented in the Supplemental DEIS/Final EIR contradict this assertion. Massport shows a pattern of investment that clearly favors the improvement of passenger access to only Logan Airport, including: ▪ The implementation of a single inter-modal air transport transfer station – the so-called AITC – serving only Logan Airport. A credible demand diversification strategy would distribute such centers throughout the region, connecting Metropolitan Area passengers with all regional airport centers. Not even a connection to Worcester is planned; ▪ The implementation of a new, fourth Logan Express in the North Shore, explicitly serving market areas that directly compete with Manchester airport. This is not an example of a cooperative planning effort with other airports; and ▪ The proposed construction of a rail link providing access from downtown Boston to T.F. Green. This high-cost, low volume, Boston-centric transportation project will take many years to complete, yielding benefits that, today, could be realized through the cooperative development of bus services modeled on the successful Logan Express program. The scope and

		scale of this project is clearly not pertinent to the immediate needs for improved intra-regional transportation investment that Massport purportedly supports.
Regional Transportation	Massport must quantify the effects of the (above stated) measures upon projected passenger levels at each of the airports including Logan. The projections for ridership of Amtrak's high-speed rail should be updated to best reflect current information.	See above comment. Moreover, the regional analysis presented in the Draft EIS/R and Supplemental DEIS/Final EIR erroneously dismisses the direct connection between the effect of regional air transportation decentralization and the conditions that Massport cites in its effort to justify the construction of additional airside capacity; it misrepresents the service area for Logan, in order to overestimate future demand; it omits an analysis of the market share that regional airports service from areas assumed to be supported solely by Logan; misrepresents and underestimates the potential diversion of future air transportation market share from Logan to regional airports and alternative modes of transportation, particularly rail services; presents no tangible evidence of serious, concerted support for continued regionalization, and in fact, shows evidence of infrastructure investment designed to enhance the dominance of Logan in the regional transportation network; and omits an analysis of tangible economic benefits, particularly in comparison to the minute regional development benefits associated with the Preferred Alternative.
Regional Transportation	The Final EIR must try to evaluate the environmental impacts of regional and local improvements. Because Providence and Manchester are in different states, the Secretary did not require Massport to do an EIR level review of those facilities, but rather: ▪ Massport should rely on existing reports to summarize information on the predicted levels of environmental impacts (i.e. noise, emissions, vehicle miles traveled impact on wetlands…) caused by the physical improvements and predicted passenger levels.	Massport's response is inadequate. Massport provides in Appendix B available environmental documents for the regional airports and summarizes predicted levels of environmental impacts of proposed improvement projects and forecast activity levels. A full analysis should have been presented in the body of the SDEIS/FEIR rather than tucked away in an Appendix.
Regional Transportation	Massport argues that commercial service at Hanscom is not likely to	Massport's response is inadequate. Massport repeatedly attempts to unlink

	constitute a feasible alternative to Logan in the foreseeable future. To back up Massport's contention Massport in the Final EIR should: ▪ address in qualitative terms, the environmental impacts of commercial service at Hanscom ▪ address in qualitative terms the opportunity to divert even a higher share of Logan's GA to Hanscom and other regional airports and any legal impediments to such measures.	the effects of regionalization from the justification to add additional runway capacity in the form of the Preferred Alternative. The degree to which air transportation is decentralized in the region will determine the degree to which Logan's assets will be utilized. Although Massport claims it is promoting the use of regional airports, the facts presented in the SDEIS/FEIR contradict this assertion. Massport demonstrates a pattern of investments that clearly favors the improvements of passenger access only at Logan.
Regional Transportation	In the Final EIR Massport should report on the status of MEPA review for proposed expansion of New Bedford Airport.	Massport's response is inadequate. Massport stuck in a footnote, a statement that simply says that MEPA/NEPA process underway and a DEIS/DEIR is due out at the end of 2001. 17.84
Regional Transportation	In the Final EIR Massport's Proposed 61 findings must detail specific steps to be taken by Massport and other state transportation agencies to ensure that Worcester, Manchester, Providence and Logan will operate jointly as the key elements in an efficient and environmentally balanced regional air network.	Massport's response is inadequate. See Section 8.7. Their "steps" are vague. Massport should include a proposed schedule of when these specific things will occur; there should be a commitment to work with NH and RI to permit shuttles (like Logan express) into the state to transport passengers; Massport should install signs on the highway (quickest route to Manchester / Providence / Worcester) to encourage passengers to use alternatives. Moreover, although Massport claims it is "promoting the use of regional airports and travel modes to provide relief to Logan Airport", the facts presented in the Supplemental DEIS/Final EIR contradict this assertion. Massport shows a pattern of investment that clearly favors the improvement of passenger access to only Logan Airport, including: ▪ The implementation of a single intermodal air transport transfer station – the so-called AITC – serving only Logan Airport. A credible demand diversification strategy would distribute such centers throughout the region, connecting Metropolitan Area passengers with all regional airport centers. Not even a connection to Worcester is planned; ▪ The implementation of a new, fourth Logan Express in the North Shore, explicitly serving market areas that

		directly compete with Manchester airport. This is not an example of a cooperative planning effort with other airports; and ▪ The proposed construction of a rail link providing access from downtown Boston to T.F. Green. This high-cost, low volume, Boston-centric transportation project will take many years to complete, yielding benefits that, today, could be realized through the cooperative development of bus services modeled on the successful Logan Express program. The scope and scale of this project is clearly not pertinent to the immediate needs for improved intra-regional transportation investment that Massport purportedly supports.
Peak Period Pricing	The Draft EIR did not provide enough information to discount PPP as a legitimate and perhaps necessary part of the environmental mitigation associated with the airside improvements. The Final EIR must include: ▪ a much more refined analysis of PPP including a full evaluation of the positive and negative environmental impacts (this analysis should account for potential alterations in flight mix resulting from PPP and should draw upon past PPP analysis such as PACE and 1993 Strategic Assessment Report ▪ The final EIR should reanalyze the delay effects of a PPP program that contains a tightly crafted exemption for the greatly affected communities to ensure they do not lose access, through Logan or other regional airports, to the national air network.	Massport's response is inadequate. Massport's overall analysis of PPP is insufficient because there does not appear to have been any cost benefit analysis done, and also Massport did not make a fair presentation of PPP because rather that doing their analysis with PPP being implemented first, then the runway, the mislead the public into believing that the runway will serve to reduce the greatest hours of delay. The implementation of PPP would provide immediate relief (as opposed to waiting for a runway to be built) and it may provide a significant amount of relief so as to conclude that no investment is needed (i.e. no need to build the runway).
Peak Period Pricing	In the Final EIR and the Proposed 61 Findings Massport should commit to regular monitoring of Peak-Period airline schedules and delays, to be reported in the Generic EIR and its Annual Updates.	Massport's response is inadequate. Massport should commit to trying PPP before investing in a runway to determine if a substantial amount of delays can be relieved with no impact on the environment and at very little cost as opposed to the huge investment in

		construction. Also PPP will provide immediate relief from delay. Purpose is to reduce operations per hour thus reducing delay. PACE program in the past is evidence that congestion pricing at Logan reduces delay.
Peak Period Pricing	The Final EIR must define appropriate conditions at which Massport will begin seeking the necessary federal and state regulatory process in order to implement a properly structured PPP program.	Massport's response is inadequate and non-responsive. Massport should commit to trying PPP or another form of congestion pricing before investing in a runway to determine if a substantial amount of delays can be relieved with no impact on the environment and at very little cost as opposed to the huge investment in construction. Also congestion pricing will provide immediate relief from delay. Purpose is to reduce operations per hour thus reducing delay. PACE program in the past is evidence that congestion pricing at Logan reduces delay.
Segmentation	The Generic EIR is expected to provide the "big picture" cumulative analysis of Logan's operations, impacts and mitigations.	The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements. All projects, landside and airside, should have been incorporated into the DEIS/R or SDEIS/FEIR to give the public a full picture of the impacts of the entire Project. Presenting the Project in two separate documents is confusing and does not permit the public the opportunity to read one document and to fully understand the short-term and long-term impacts. This also permits Massport to segment the Project. Also there is conflicting data in the SDEIS/FEIR and the 1999 ESPR.
Environmental Justice	The Final EIR should include: ▪ more detailed demographic data on the affected populations in both tabular and graphic form ▪ Final EIR should include a more detailed analysis of the full range of impacts, a comparison of the affected population with that of Boston and other affected municipalities ▪ Final EIR should include a discussion of the community participation used in preparing the DEIR and the FEIR.	Massport's response is inadequate. Massport should have used data from the 2000 census. Should have produced the entire SDEIS/FEIR in Spanish and Portuguese. Massport only held 1 meeting on SDEIS/FEIR in Boston for the public and limited comments to 3 minutes as opposed to 5 minutes the public was promised. Many of the chapters gloss over the litany of issues impacting the communities surrounding the airport. Odor, while noted, was not explored in detail as to the impact on the communities closest to Logan. The odors have a disproportionate impact on communities such as East Boston and are one in a long list of indirect impacts that have not been factored in as part of a

		formal review. Massport does not consider emission factors and dispersion/exposure models in the analysis of this concern. Also, an environmental justice assessment should address how the population that benefits from the project compares with the population that is burdened with the project's adverse impacts. Comparing the communities that use the airport with communities that bear the burden of the airports impacts (rather than simply using Suffolk County) would help illuminate the relative benefits and burdens of the project and the corresponding environmental justice implications.
Noise	The Final EIR should quantify the number of "new" people within each noise contour under the Preferred Alternative. It should also present information on the 60-65 dB noise contour within the text not just the appendices.	Massport's response is inadequate. The 65 dB DNL is too high, only the FAA and DOD suggest 65 dB is acceptable. Massport should redo noise figures using 55 dB and 45 dB. Massport also should redo noise contours for over 1000 feet AGL. Further, Massport should redo noise contours using true and correct data to ensure that all eligible home are included (i.e. data regarding Hull) and redo data using realistic fleet mix.
Noise	At the core of the noise abatement policy stands the commitment in the 1994/95 GEIR to "minimizing nighttime noise and to addressing and responding to noise issues and complaints."... it is time to turn these general policy goals into specific noise mitigation commitments.	Massport's response is inadequate. Massport's noise contours have been manipulated. The use of the 65 dB DNL is unreasonable. Only the FAA and DOD suggest 65 dB is an acceptable DNL value. Massport should redo the noise values using 55 dB and 45 dB. Massport also used an arbitrary cutoff of 1000 ft. AGL. Since it is obvious that aircraft produce noise when traveling over land and water at 1000 ft., Massport should redo its contours at varying levels over 1000 ft. Massport did not use true and correct data. Massport also failed to use a realistic fleet mix when calculating their noise data. Massport also misrepresents the actual over water nighttime flights.
Noise	The Final EIR and the Proposed Section 61 Finding should contain feasible implementation measures to ensure full access to the soundproofing program for all residents who are entitled to its benefits.	Massport's response is inadequate. Massport's noise contours have been manipulated. The use of the 65 dB DNL is unreasonable. Only the FAA and DOD suggest 65 dB is an acceptable DNL value. Massport should redo the noise values using 55 dB and 45 dB. Massport also used an arbitrary cutoff of 1000 ft. AGL. Since it is obvious that aircraft

		produce noise when traveling over land and water at 1000 ft., Massport should redo its contours at varying levels over 1000 ft. Massport did not use true and correct data. Massport also failed to use a realistic fleet mix when calculating their noise data. Massport also misrepresents the actual over water nighttime flights.
Noise	Given the number of people who are potentially ineligible for soundproofing because of modeling limitations, in the Final EIR Massport should examine further refinements to its contours that would ensure full access to soundproofing for all affected residents. Also in the Final EIR, Massport must commit to providing soundproofing for all residents currently within the 65 dB contour, even if they would otherwise lose their eligibility as a result of this project.	Massport's response is inadequate. Massport's noise contours have been manipulated. The use of the 65 dB DNL is unreasonable. Only the FAA and DOD suggest 65 dB is an acceptable DNL value. Massport should redo the noise values using 55 dB and 45 dB. Massport also used an arbitrary cutoff of 1000 ft. AGL. Since it is obvious that aircraft produce noise when traveling over land and water at 1000 ft., Massport should redo its contours at varying levels over 1000 ft. Massport did not use true and correct data. Massport also failed to use a realistic fleet mix when calculating their noise data. Massport also misrepresents the actual over water nighttime flights.
Noise	The Secretary was concerned that the residences most in need of soundproofing will be in low income areas with relatively high proportions of sub-standard housing. The Final EIR should explain how often such circumstances have occurred in the past. If some (presumably low income) residents are likely to be denied noise mitigation on this grounds, the FEIR and the Proposed Section 61 Finding should consider financial or other programs to ensure equal access to noise mitigation.	Massport's response is inadequate. There have been concerns in the past that the FAA has not lived up to its commitments in regards to soundproofing. Massport failed to set forth in detail the amount of grant funds that will be made available to bring buildings up to code to proceed with sound insulation work, i.e. is there a set amount that the FAA will make available or will the FAA, on an as-needed basis, make funds available. Also, as previously stated there is great concern that individuals that should be available for soundproofing will be overlooked due to Massport's manipulated contours. Massport should be required to redo its noise contour using 55 dB and 45 dB; true and correct data; values over 1000 ft.; and using a realistic fleet mix.
Noise	The Final EIR should discuss whether any updates of the PRAS goals are contemplated, and detail any mechanisms for ensuring that the program fulfills its objective of creating an equitable noise distribution.	Massport's response is inadequate. The CAC has rejected PRAS. Also FAA historically has not complied with PRAS goals.
Noise	Massport must show in the FEIR that its prediction of the future effects of	Massport's response is inadequate. The CAC has rejected PRAS. Moreover,

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	the PRAS goals do not over-estimate FAA's ability and willingness to implement them, as based on past experience.	Massport already has a monitor program in place, which obviously has little effect on ensuring that the FAA controllers comply with PRAS. Rather than implementing any kind of enforcement of the PRAS goals, Massport simply commits to expand the Massport Quarterly Noise Report by including all PRAS reports generated by the system and to expand the distribution list. There is no indication that these additional tracking requirements are going to lead to an increased adherence to PRAS by the FAA.
Noise	The FEIR and the Proposed Section 61 Finding must include protocols for monitoring adherence to the PRAS goals, and periodic disclosure of the monitoring results.	Massport's response is inadequate. The CAC has rejected PRAS. Moreover, Massport already has a monitor program in place, which obviously has little effect on ensuring that the FAA controllers comply with PRAS. Rather than implementing any kind of enforcement of the PRAS goals, Massport simply commits to expand the Massport Quarterly Noise Report by including all PRAS reports generated by the system and to expand the distribution list. There is no indication that these additional tracking requirements are going to lead to an increased adherence to PRAS by the FAA.
Noise	The Final EIR should discuss the relationship between the airside program and the recently completed Runway 27 EIS, describe any cumulative impacts on the corridor, and analyze the consistency of the noise impacts with the PRAS goals.	Massport's response is inadequate. Massport falsely and deceptively declares that it has responded to the Secretary's Comments in Section 5.2.3 and Section 6.2. Neither section is responsive. Massport fails to discuss the relationship between the Airside Program and the Runway 27EIS, failing to describe cumulative impacts. Although Massport purports to analyze the consistency of noise impacts with PRAS goals, it fails to present any credible foundation for this analysis. Finally, any such analysis is inadequate, since Massport has failed to conduct an airspace design analysis or to accurately measure noise impacts of Runway 14/32.
Noise	The PRAS goals seek to route all nighttime flights over the water between 12 PM (sic) and 6 AM. In the FEIR, Massport should report on the feasibility of extending this preferential nighttime period to the hours of 10 PM to 7 AM, and the effect of this change on noise levels and contours.	Massport's response is inadequate. Massport falsely and deceptively declares that it has responded to the Secretary's Comments in Section 4.3.6. However, Massport utterly fails to analyze or consider either a base case for the noise levels and contours resulting from nighttime flights over the water during the hours of 12 PM and 6 AM or

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		an analysis for the effect and noise levels and contours of extending such hours to 10 PM to 7 AM. In fact, there is no direct discussion of nighttime noise levels or contours in Section 4.3.6 whatsoever.
Noise	Massport should begin discussions now with FAA, with the goal of instituting restrictions, either locally or nationally, on hush-kitted Stage 3 aircraft.	Massport's response is inadequate. The United States Government has consistently championed the right of U.S. carriers to fly retrofitted Stage 2 aircraft for as long as they want to the great consternation of the European Community. Although airport operators, including Logan, have expressed the desire to see the removal of retrofit Stage 2 aircraft from the fleet, there is no movement on the part of the United States Government or the Air Traffic Association in this direction. Massport should state its efforts and intentions as to how it intends to reduce the use of hush-kitted aircraft at Logan.
Air Quality	Now is the time to implement the broad goal of maintaining or reducing Logan's overall environmental impacts, even as annual passenger volumes rise in the future. To make this commitment more effective, in the GEIR Massport must examine the feasibility of a system of market-based, revenue-neutral landing fees that reward cleaner planes with lower charges, on the principle that "the polluter pays."... In the GEIR, I am directing Massport to develop and model a system of emissions-based landing fees.	The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements. The public should be entitled to review one document presenting all of the environmental impacts of the project so that they can fully understand the short-term and long-term impacts of the entire project. Has the feasibility study that is to include implementing measures to reduce NOx emissions at Logan been completed? If not, it should be completed before the Secretary makes a determination regarding the adequacy of the FEIR.
Air Quality	As an initial step toward reducing emissions, Massport should set numerical annual targets in the GEIR for the conversion of its tenants' ground service equipment to clean fuels, and for providing electric power to aircraft at all gates.	The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirement. The public should be entitled to review one document presenting all of the environmental impacts of the Project so that they can understand the short-term and long-term impacts of the entire projects.
Ground Transportation	One of the cornerstones of Massport's ground access strategy is a commitment to a 35.2% mode share for High Occupancy Vehicles (HOV) when passenger volumes reach 37.5 million annually....[A]lthough this goal translates into an increase in HOV	The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements. The public should be entitled to review one document presenting all of the environmental impacts of the Project so that they can understand the short-term and long-term

	mode shares from the present, it also represents a substantial increase in the absolute number of non-HOV trips to the airport, due to the large increase in total number of passengers. Massport has not shown how these non-HOV trips will be accommodated under the parking freeze. Massport should consider a higher target percentage for HOV at 37.5 million annual passengers, and discuss the issue in the GEIR.	impacts of the entire project. Moreover, Massport's response to this comment is inadequate as it refers the reader to the 1999 ESPR, a document that is more than 300 pages of text (excluding appendices) with no direction as to where this issue is fully explored.
Ground Transportation	Massport should also consider enforcement mechanisms for whatever HOV percentage emerges...	Massport's response is inadequate. The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements. The public should be entitled to review one document presenting all of the environmental impacts of the Project so that they can understand the short-term and long-term impacts of the entire project. Moreover, Massport's response to this comment is inadequate as it refers the reader to the 1999 ESPR, a document that is more than 300 pages of text (excluding appendices) with no direction as to where this issue is fully explored.
Ground Transportation	In the GEIR, Massport should also consider the consolidation of rental car lots and the courtesy vehicles serving them.	The treatment of this issue is a clear exercise of segmentation in violation of MEPA/NEPA procedural requirements. The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements. The public should be entitled to review one document presenting all of the environmental impacts of the Project so that they can understand the short-term and long-term impacts of the entire project. Moreover, Massport's response to this comment is inadequate as it refers the reader to the 1999 ESPR, a document that is more than 300 pages of text (excluding appendices) with no direction as to where this issue is fully explored.
Ground Transportation	[T]he Final EIR and the analysis in the next GEIR should reflect proposed MBTA improvements in transit access to Logan, including the AITC, the Blue Line modernization, and the Urban Ring.	Massport's response is inadequate. Moreover, the treatment of this issue is a clear exercise of segmentation in violation of MEPA/NEPA procedural requirements. The public should be entitled to review one document presenting all of the environmental impacts of the Project so that they can understand the short-term and long-term impacts of the entire projects.

Alternatives	Any proposal to use Runway 14/32 in a bi-directional manner would need additional MEPA review, including the scoping, preparation, and review of an entirely new EIR document.	Both the Secretary's comment and Massport's response suggest that Runway 14/32 could become bidirectional in the future in a subsequent MEPA review. The potential short-term, long-term and cumulative impacts of Runway 14/32 including the potential to make it bidirectional should be addressed in the SDEIS/FEIR. Massport's failure to do so constitutes unlawful segmentation under MEPA/NEPA requirements.
Environmental Review Process	The Proposed Section 61 Findings in the Final EIR should include this enforceable commitment to unidirectionality. The Final EIR should also document any other legal or administrative processes, or any operational or environmental constraints that can assure unidirectionality.	The Section 61 Findings do not include any enforceable commitment to unidirectionality. By completing only those components of Runway 14/32, which will enable unidirectional operation, Massport does not forego or preclude later construction of components which would be necessary for bidirectional operations. These can and would be completed later after completion of an unlawfully segmented MEPA/NEPA review process. Massport's recitation that it "..will, if requested, enter into an appropriate contract with an appropriate governmental body and/or representative community group(s) to provide rights to enforce the intended unilateral restriction of Runway 14/32" does not in any way bind Massport to enter such a contract; does not specify what would constitute the terms or time limits of such an "appropriate contract"; does not specify what would constitute either an "appropriate governmental body" or "an appropriate representative community group"; does not specify what "rights" would be created or how they could be enforceable; and does not reasonably address concerns regarding Massport's past failure to honor such contracts as court-entered stipulations and other agreements which specified that it would not construct the runway which it now seeks to construct in violation of the stipulation and which suggests it can be trusted to make unidirectional.
Construction	The Final EIR should include a detailed construction management plan that quantifies the number of daily and total truck trips.	Massport's response is inadequate. Massport directs the reader to Section 6.9 of the SDEIS/FEIR in response to Secretary's request for a quantitative analysis of the number of daily and total truck trips. However, this section only identifies projected trips for the airside

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		improvements regarding the preferred alternative, and not the average cumulative daily truck trips for all concurrent airport projects. A review of this section is misleading, as it does not give the public the "big picture". An adequate response to the Secretary's comment would have been to refer the reader to Table 7.5-1 on page 7-25 which shows, by way of example, that during just the first quarter of construction, rather than 61 daily truck trips, there is actually 364 daily truck trips to and from the airport.	
Construction	The Final EIR should also address the cumulative impacts of those construction activities for the airside projects occurring simultaneously with Central Artery/Tunnel construction in East Boston, other projects at Logan Airport, and any other major construction activities planned to occur in East Boston.	Although Massport acknowledges that the SDEIS/FEIR construction schedules overlap significantly with the CA/T construction during the period of 2003-2007. Although Massport has proposed management coordination with other projects and has incorporated some mitigation measures in proposed contracts and subcontracts, it has not adequately demonstrated how construction schedules could be changed to reduce the cumulative effects of preexisting projects nor has Massport delineated the role which community organizations would play in the preparation and enforcement of such mitigation measures.	17.90
Construction	The Final EIR should also disclose the full impacts of any nighttime construction, and include an analysis of nighttime construction noise in residential areas potentially affected.	Massport's response is inadequate. Massport fails to disclose the full impacts of nighttime construction noise by underestimating the severe impacts of an estimated nighttime noise increase of up to 3.9 dB over ambient noise levels and by failing to disclose the data it used to calculate said impact.	17.91
Construction	The Final EIR and the GEIR should also discuss the feasibility of Massport's participation in the Clean Air Construction Initiative, both with respect to this project and other construction projects at the airport. The Proposed Section 61 Findings should include appropriate commitments for construction period mitigation, in particular for the traffic, air quality, and noise impacts discussed above.	The treatment of this issue is a clear exercise of unlawful segmentation in violation of MEPA/NEPA procedural requirements.	
Soil/Sediment	Massport's preferred alternative involves a substantial amount of soil excavation. The Department of Environmental Protection has raised several issues regarding excavate	Massport's response is inadequate. Massport fails to explain why it uses classifications and terminology which frustrates disclosure requirements and obfuscates factual inaccuracies.	17.92

	classification and management, to which the Final EIR should respond in detail.	
Noise	The Final EIR should analyze the environmental impacts of the airside projects (including cumulative impacts with other airport operations) on the Harbor Islands, Arnold Arboretum, Franklin Park, and the Emerald Necklace.	Massport's response is inadequate. Massport has failed to apply the appropriate noise metric to determine noise impacts on park lands, historic sites and recreational facilities. Massport also engages in misleading, deceptive and false analysis when it suggests there can be no noise impacts on such areas because: (1) They are either inside the 65 dB contour and therefore are already seriously impacted; or (2) they are outside the 65 dB contour and therefore have no significant impact; or (3) if the contour has shifted and increased noise impacts on a new area or community, there are still no significant impacts because this is simply an "equitable redistribution" of noise with an "off selling" positive impact on other communities. Massport fails to address significant noise impacts on the Boston Harbor Islands, Harbor beaches, marine activity and increased utilization of the Boston waterfront.
Ecosystem	The discussion of on-site mitigation (for rare species impacts] in the DEIR is generally adequate. The Final EIR should provide greater detail on the proposed off-site mitigation, including the specifics of the habitat restoration proposed at the Massachusetts Military Reservation. The Final EIR should also include sufficient information for the Natural Heritage Program to evaluate, the merits of a Conservation Permit. The Proposed Section 61 Finding should include all on-site and off-site mitigation for impacts to rare species.	Massport fails to provide adequate detail for off-site mitigation and fails to provide in its Section 61 Findings any specifics as requested by the Massachusetts Military Reservation.
Environmental Review Process	The Final EIR should include Proposed Section 61 Findings for each area of impact associated with Massport's preferred alternative. The Secretary reminded Massport of the importance of the Section 61 Findings as a mechanism for formalizing the mitigation commitments that emerge from the EIR process.	Massport's response is inadequate. Until there is a complete and comprehensive revision of the Project consistent with the procedural and substantive requirements of MEPA/NEPA, there can be no adequate Section 61 Findings.
Environmental Review Process	The Final EIR should include a copy of this Certificate and copies of all comments received, and it should respond to all substantive comments	Massport's response is inadequate. Massport failed to adequately respond to all substantive comments. As a case study, we present Massport's inadequate

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	received.	response to the comments of Stephen Lathrop, an executive member of the CAC and a private citizen of Hull.
Environmental Review Process	For those who submitted form letters for which addresses are available, Massport should send a Notice of Availability of the Final EIR and include information on comment deadlines and the time-sensitive nature of the review process. For those who submitted individual comment letters, Massport should circulate an Executive Summary of the Final EIR . ... Massport should circulate the full Final EIR to its standard distribution list of agencies and community groups, as well as to any additional parties specified in Section 11.16 of the MEPA regulations ....[Massport should] furnish a full copy of the EIR to any party who requests a copy.	Massport's response is inadequate. Massport failed to file the SDEIS/FEIR with the Hull Public Library. Massport had failed to file the DEIS/R in Hull, and in response to comments regarding this failure, committed itself to file the SDEIS/FEIR at the Hull Public Library. Massport finally filed the DEIS/R but has failed to file the SDEIS/FEIR at the Hull Public Library. Massport is in violation of MEPA/NEPA regulations regarding circulation.

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2. ADMINISTRATOR'S DIRECTIVE

Pursuant to 301 CMR 11.07(l) of the MEPA Regulations the Final EIR shall include "a response to the certificate of the Secretary on the previous review document and each comment received on the previous review document, provided that the subject matter of the comment is within the Scope…". Massport has failed to adequately address the Administrator's Directive. Set forth below is a chart detailing Massport's inadequate response to the Administrator's Directive. Massport's failure to adequately address the comments of the Administrator is a serious violation of MEPA/NEPA regulations.

The Federal Aviation Administration's Directive to the Massachusetts Port Authority for Additional Analyses For The Logan Airside Supplemental Draft EIS

Topic	Administrator's Directive	Comment
Runway 14/32	Is a 5,000-ft. runway 14/32 effective given the expected use of regional jets in the future fleet mix? (To be performed by FAA consultant) ▪ Verify and confirm previous survey of airlines and manufacturers to determine	Massport's response is inadequate. The Final EIR has failed to adequately address the minimum arrival and landing distances for regional jet aircraft. Massport failed to verify and/or confirm any arrival and landing distances for regional jet aircraft

	minimum arriving/takeoff distances for regional jet aircraft.	from the airlines. Instead, Massport, in complete disregard of the FAA's directive, relies upon a the *Review of Forecast Regional Jet Utilization – Proposed Runway 32 at Logan International Airport* which incorporates a purported document prepared by Simat, Helliesen & Eichner, that only "tabulates the minimum landing distance", and is conspicuously omitted from the Supplement DEIS/ Final EIR. Massport fails to disclose that the Regional Jet Fleet, based upon current order, will increase by Five Hundred percent (500%) and replace most turboprop aircraft at major airports such as Logan. Massport failed to report on the minimum landing conditions for higher temperatures or higher humidity days, which may increase required runway lengths beyond 5,000 feet, and thus adding to the reality that Proposed Runway 14/32 may not decrease delays to the extent represented by Massport. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Runway 14/32	Is a 5,000-ft. runway 14/32 effective given the expected use of regional jets in the future fleet mix? (To be performed by FAA consultant) ▪ Research regional jet aircraft usage and runway length requirements at other airports.	Massport's response is inadequate. In contradiction to Massport's statement that they have fully evaluated the effects of changes in the Regional Jet fleet, Massport fails to accept the conclusions of the FAA's consultant, Jim Muldoon, who concludes that Regional Jets will not or cannot use a 5,000 foot runway. Massport fails to incorporate or even consider Muldoon's conclusions in their delay reduction of Runway 14/32 analysis. Massport failed to report on the minimum landing conditions for higher temperatures or higher humidity days, which may increase required runway lengths beyond 5,000 feet, and thus adding to the reality that Proposed Runway 14/32 may not decrease delays to the extent represented by Massport. Massport's reference as to the location of

		the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Runway 14/32	Is a 5,000-ft. runway 14/32 effective given the expected use of regional jets in the future fleet mix? (To be performed by FAA consultant) ▪ Review forecast mix of regional jet aircraft types at Logan.	Massport's response is inadequate. Section 4.2.2.2, of the Supplement DEIS and Final EIR, and the *Review of Forecast Regional Jet Utilization – Proposed Runway 32 at Logan International Airport*, attached in Appendix C of the Supplement DEIS and Final EIR fail to present an accurate forecast mix of the regional jet aircraft types at Logan for any benchmark. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Runway 14/32	Is a 5,000-ft. runway 14/32 effective given the expected use of regional jets in the future fleet mix? (To be performed by FAA consultant) ▪ Develop estimate of probable regional jet utilization of a 5,000 ft. Runway 14/32.	Massport's response is inadequate. Section 4.7.5 of the Supplement DEIS and Final EIR, and the *Review of Forecast Regional Jet Utilization – Proposed Runway 32 at Logan International Airport*, attached in Appendix C of the Supplement DEIS and Final EIR, fail to establish any estimate of probable regional jet utilization of a 5,000 ft. Runway 14/32. Instead, Massport has responded with contrived "Annual Delay Hours Saved" and "Percent of Delay Savings", as illustrated in Table 4.7-8, *Sensitivity of Delays to Regional Jet Use of Runway 32*, based upon an inaccurate fleet mix projection for a single 37.5M High RJ Secnario. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Regionalization	Expand regionalization analysis contained in Interim Supplemental Draft EIS ("Brown Book"). ▪ Discuss proposed New England Regional	Massport's response is inadequate. Other than Table 2.9-3, *New England Airport System Study Proposed Scope of Work,* on page 2-51of the Supplemental DEIS/FEIR, and the Nine (9) page copy of a slide

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	Aviation System Study and proposed work scope.	presentation on the *FAA Regional System Plan Update,* attached in Appendix B of the Supplemental DEIS/FEIR, Massport did not present any meaningful discussion of the proposed New England Regional Aviation System Study or the proposed work scope. In fact, Massport presented no discussion of the New England Regional Aviation System Study and proposed work scope, and the Study's purpose, background, organization, issues considered, structure, content, tasks, and anticipated products. In fact, Massport's entire focus on New England Regional Aviation System Study and proposed work scope appears limited to Two (2) paragraphs on page 2-49 of Supplemental DEIS/FEIR, which are wholly inadequate and unresponsive to the FAA's directive. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Regionalization	Expand regionalization analysis contained in Interim Supplemental Draft EIS ("Brown Book"). ▪ Update to reflect the current status of traffic and services at the regional airports, Amtrak's Acela service, and ground access projects.	Massport's response is inadequate. Massport failed to provide any analysis or discussion of the ground access projects, current traffic, and services at the Worcester Regional Airport. Massport failed to provide an adequate analysis or discussion of the ground access projects, current traffic, and services for the Hartford/Bradley International Airport, the Portland International Jetport, Bangor International Airport, Burlington International Airport, or Tweed-New Haven Airport. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Regionalization	Expand regionalization analysis contained in Interim Supplemental Draft EIS ("Brown Book"). ▪ Add historical context and on-going nature of regionalization efforts.	Massport's response is inadequate. Massport failed to present any historical context or any "on-going nature" of regionalization efforts, other than to describe the relationship of regional airports to Logan in section 2.2.2., *The Role of Regional Airports* of the Supplemental

		DEIS/FEIR. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Peak Period Pricing	Expand analysis of Peak Period Pricing. ▪ Review changes in airline scheduling activity at Logan and assess how and why the demand profile has flattened over time.	Massport's response is inadequate. Massport did not draw any focused comparisons between changes in airline scheduling over time to assess the flattening of the demand profile. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Peak Period Pricing	Expand analysis of Peak Period Pricing. ▪ Assess whether the flattened profile or a more peaked profile is likely to occur in the new future fleet (2015 Modified 37.5M RJ fleet).	Massport's response is inadequate. Massport did not present any cogent assessment as to whether the flattened profile or a more peaked profile is likely to occur in the new future fleet (2015 Modified 37.5M RJ fleet). Massport failed to explain any of the operational analysis or the methodology utilized to determine the long-term planning forecast under the 2015 Modified 37.5M RJ Fleet Scenario. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Peak Period Pricing	Expand analysis of Peak Period Pricing. ▪ Discuss the design of a Peak Period Pricing program that would impact regional jet scheduling practices at Logan: Base analysis on modified 2015 Modified 37.5M RJ fleet, using an updated demand profile and a small community exemption program. Discuss the economic cost of Peak Period Pricing to the consumer.	Massport's response is inadequate. Massport's overall analysis of PPP for regional jet scheduling practices is insufficient because there does not appear to have been any cost benefit analysis done, and also Massport did not make a fair presentation of PPP because rather than doing their analysis with PPP being implemented first, then the runway, they mislead the public into believing that the runway will serve to reduce the greatest hours of delay.

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	Discuss the uniqueness of Cape Air and the communities it serves.	Massport failed to present any discussion or analysis of the economic cost, nevertheless a cost-benefit analysis or examination of a consumer's willingness to pay, of Peak Period Pricing to consumers. Massport failed to describe the model or the data it utilized so that it can be analyzed and validated. Massport failed to present any discussion or analysis of the uniqueness of Cape Air and the communities it serves. Despite Massport's insistence that such analysis in Chapter 4, there is no reference to such analysis, let alone, a reference to "Cape Air" in the index of the Supplemental DEIS/FEIR. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Peak Period Pricing	Expand analysis of Peak Period Pricing. Identify known, comparable demand management strategies that are in use or have been proposed by other airports. ▪ Identify known, comparable demand management strategies that are in use or have been proposed by other airports.	Massport's response is inadequate. Massport failed to adequately analyze or discuss the successful implementation of congestion pricing in Massachusetts. Additionally, Massport failed to provide a thorough analysis of Peak Period Pricing and the demand management mechanisms considered at New York LaGuardia Airport, or additional case studies. Massport made no discussion of slot controls that have been employed at both the local and federal levels. Locally imposed slot rules currently exist at Westchester County Airport (HPN) in White Plains, N.Y., and Orange County Airport (MGL) in Montgomery, N.Y. Additionally, Massport made no mention of long-standing slot controls at Chicago O'Hare (ORD), La Guardia (LGA) John F. Kennedy (JFK) and the Ronald Reagan Washington National Airport (DCA). Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include

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		any specific page reference.
Delay Reduction and Environmental Benefits	What impact does the 2015 Modified 37.5M RJ fleet mix have on delay reduction benefits and environmental impacts? ▪ Develop 2015 fleet mix and demand profile assuming 37.5M passengers and increased RJ utilization.	Massport's response is inadequate. Massport has failed to disclose how it determined in its 37.5M High RJ fleet mix that regional jets will replace 747s and reduce scheduled flights of 747s in 2015 from 20 to 2 per day. The High RJ scenario assumes that the increase in RJ operations will coincide with a decrease in large jet operations. While it may be true that the RJs are used to replace some DC-9s, B727s, or MD80s as well as replacing small prop aircraft, it is inconceivable that a EMB 145 (50 passenger commuter jet) will replace a B747 on a flight from Boston to London. However, in the Supplemental DEIS/Final EIR the High RJ Fleet shows a reduction of heavy jets like the B747 with a commensurate increase in RJ operations. Naturally, a RJ operation produces much less noise than does the B747 that it replaces. **Specifically, B-747 go from 20.5 operations per day under the 37.5M High fleet to 2.2 operations per day under the 37.5M High RJ fleet**; MD11 go from 17.9 operations per day to 4.2 operations per day; and the sum of 747, 757, 767, 777 and MD11 go from 269 operations per day under the 37.5M High fleet to 169 operations per day under the 37.5M High RJ fleet. Only the 767 and 777 show small increases; everything else decreases precipitously. (emphasis added). Therefore, any delay reduction analysis based upon the 37.5M RJ Fleet is deceptive, misleading, and inaccurate. Furthermore, any delay analysis which assumes that CRJ-200s will land on Runway 14/32 is misleading, deceptive, and inaccurate. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Delay Reduction and Environmental Benefits	What impact does the 2015 Modified 37.5M RJ fleet mix have on delay reduction benefits and environmental impacts? ▪ Assess the impacts of the new fleet on	Massport's response is inadequate. The Supplemental DEIS/Final EIR noise contours are inconsistent with the Supplemental DEIS/Final EIR flight tracks.

	delays, runway utilization, noise contours and noise-exposed populations for Alternatives 1, 1A, 2, 3 and 4.	Figure 5.2-2 (page 5-17) of the Supplemental DEIS/Final EIR shows "Modeled Arrival Flight Tracks." Flight tracks for arrivals to Runway 33L are in line with the extended Runway 33L centerline from about 4 miles from the runway up to the threshold of the Runway. Figure F-2 on page F-7 of the 1999 ESPR published by Massport shows a single arrival flight track to Runway 33L that is precisely the extended Runway 33L centerline. Both the Supplemental DEIS/Final EIR and the 1999 ESPR note that differences between the 1999 ESPR and the Supplemental DEIS/Final EIR are small. Figure 6.2-9 on page 6-33 of the Supplemental DEIS/Final EIR compares the 1999 ESPR contours with the 1999-29M Low No-Build prediction of the Supplemental DEIS/Final EIR. Also, Figure 6-3 of the 1999 ESPR shows the 1999 DNL noise contours for Logan. In both the Supplemental DEIS/Final EIR contours and in the 1999 ESPR contours, the "tips" of the noise contours going towards Hull follow the landing flight track to Runway 33L over Hull, the extended centerline of Runway 33L. However the "tips" of the 1999-29M Low No-Build prediction of the Supplemental DEIS/Final EIR (Figure 6.2-9 on page 6-33) drop approximately 5 degrees south of the landing flight track to Runway 33L over Hull, the extended centerline of Runway 33L. This is not an accidental discrepancy in just this figure; a similar discrepancy is evident in Figure 5.2-3 on page 5-21 of the Supplemental DEIS/Final EIR. This discrepancy that appears is simply not possible. The only simple explanation for this discrepancy is that the contours in the Supplemental DEIS/Final EIR were made with flight tracks other than those shown in the Supplemental DEIS/Final EIR or the contour generation otherwise deviates from the data given in the Supplemental DEIS/Final EIR. Any analysis of the 37.5M High RJ fleet runway utilization noise contours and noise-exposed populations is misleading, deceptive, and inaccurate. Massport's reference as to the location of

		the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Delay Reduction and Environmental Benefits	What impact does the 2015 Modified 37.5M RJ fleet mix have on delay reduction benefits and environmental impacts? ▪ Assess the impacts of the new fleet on ground noise and air quality for Alternatives 1/1A and 4.	Massport's response is inadequate. A thorough review of the Supplemental DEIS/Final EIR, the DEIS/R, the 1994/1995 Generic EIR and the March 1997 URS Emission Inventory Results indicates that Massport failed to complete an air quality analysis for the Preferred Alternative 1A. Moreover, what these documents do reveal is that Massport, in the Supplemental DEIS/Final EIR misrepresents both that such an analysis was performed and that as a result of such analysis "implementation of the Preferred Alternative would produce a reduction in emissions and an improvement in ambient air quality compared to the No Action Alternative." (See Supplemental DEIS/Final EIR, Volume 1, page ES-24.) This is a clear fabrication and misrepresentation by Massport. The emission inventories developed for the year 2010/2015 and presented in the SDEIS/FEIR in Section 6.4-2 are based on the assumption of Peak Hour Pricing. The SDEIS/FEIR text does not indicate Peak Hour Pricing is assumed in the analysis. However, the emissions contained in SDEIS/FEIR Tables 6.4-4 through Table 6.4-8 contain the same emissions values as the March 1997 Tables for Alternative 1 (which is indicated on the Tables to reflect emissions for the Runway, Taxiway and Peak Hour Pricing). Massport's Preferred Alternative 1A does not include Peak Hour Pricing. Emissions without Peak Hour Pricing would be higher than those used in the SDEIS/FEIR. Therefore, the emissions differences between alternatives presented in this section of the SDEIS/FEIR cannot be determined based on the information presented. If, as it appears, the emissions estimates in Tables 6.4-4 through 6.4-8 are used in the dispersion modeling analysis, then the predicted impacts/concentrations also assume that Peak Hour Pricing is in place and the predicted impacts or concentrations on the SDEIS/FEIR for the construction of Runway 14/32 do not represent the Preferred Alternative as identified on Page 11 of the March 2001

		Executive Summary (i.e. without Peak Hour Pricing). Massport failed to identify, analyze, or evaluate air emissions for its Preferred Alternative 1A, as well as its failure to adequately address other air emissions issues is so fundamental and so indicative of Massport's disregard of air quality regulations that placing this issue in the GEIR merely assists Massport in its continued evasion of Section 61 Finding requirements under the Massachusetts Environmental Policy Act. Massport's use of the 65 dB DNL is too high. Only the FAA and DOD suggest 65 dB is acceptable. Also according to an August 2000 GAO survey of the nation's 50 busiest commercial airports, 70% of airport noise complaints come from individuals in areas outside of the 65dB DNL contour. Massport should redo noise figures using 55 dB and 45 dB. Massport also should redo noise contours for over 1000 feet AGL. In addition, Massport should redo noise contours using true and correct data to ensure that all eligible homes are included (i.e. data regarding Hull) and redo data using realistic fleet mix. Once noise impacts are actually calculated a specific plan with earmarked funding should be developed for soundproofing houses, schools and other structures within the appropriate 65, 60, 55, 50, 45 noise contours in the Boston Metropolitan Area. Therefore, Massport's assesment of the "new fleet" on ground noise for alternatives 1A and 4 is misleading, deceptive, and inaccurate, and Massport's assessment for air emissions is nonexistent. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Delay Reduction and Environmental Benefits	What impact does the 2015 Modified 37.5M RJ fleet mix have on delay reduction benefits and environmental impacts? ▪ Perform delay sensitivity analysis using	Massport's response is inadequate. Massport failed to prepare, instead Massport modeled only a 37.7M High RJ Fleet Mix for purposes of delay analysis. However, Massport failed to accurately

	varying RJ utilization factor for Runway 14/32.	analyze delay reduction benefits, if any, for Runway 14/32 based upon the experience of Philadelphia and Baltimore, where CRJ-200s refused to land on a 5,000 foot runway. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
National Delay Context	Broaden discussion of national delays to put Logan delays into context. ▪ Assess Logan's relative national delay ranking if Runway 14/32 was available in 1998.	Massport's response is wholly inadequate. No such discussion was found. In complete disregard of the FAA's directive, without any explanation, Massport contrived delay statistics for Logan with a purported nationwide context utilizing the FAA Consolidated Operations and Delay Analysis System for the twelve month period ending November 2000. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
National Delay Context	Broaden discussion of national delays to put Logan delays into context. ▪ Discuss how delays at Logan affect the national air transportation system.	Massport's response is wholly inadequate. No such discussion was found. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
National Delay Context	Broaden discussion of national delays to put Logan delays into context. ▪ Discuss measures FAA is pursuing to reduce delays nation-wide.	Massport's response is wholly inadequate and limited in scope. Massport focused exclusively on airport structural programs, and failed to discuss or even mention Federal Aviation Administration programs, initiatives, and technologies, that have the practical effect or reducing delays and improving airside efficiency, like: Reduced Vertical Separation Requirements, Display System Requirements, Standard Terminal Automation Replacement Systems, Operational and Supportability Implementation Systems, Next Generation Air/ Ground Communications ("NEXCOM"), Global Positioning Systems,

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		and an Integrated Terminal Weather System. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Runway 14/32	Analyze potential wind/weather use restrictions on Runway 14/32 and their impact on delay reduction, runway utilization, and PRAS achievement. ▪ For the 2015 Modified 37.5M RJ fleet, analyze and compare delay levels and runway utilization patterns for: (1) No action, (2) Action [a.] As Modeled with PRAS and [b.] with wind/weather restrictions on the usage of Runway 14/32.	Massport's response is inadequate. Massport has failed to disclose how it determined in its 37.5M High RJ fleet mix that regional jets will replace 747s and reduce scheduled flights of 747s in 2015 from 20 to 2 per day. The High RJ scenario assumes that the increase in RJ operations will coincide with a decrease in large jet operations. While it may be true that the RJs are used to replace some DC-9s, B727s, or MD80s as well as replacing small prop aircraft, it is inconceivable that a EMB 145 (50 passenger commuter jet) will replace a B747 on a flight from Boston to London. However, in the Supplemental DEIS/Final EIR the High RJ Fleet shows a reduction of heavy jets like the B747 with a commensurate increase in RJ operations. Naturally, a RJ operation produces much less noise than does the B747 that it replaces. **Specifically, B-747 go from 20.5 operations per day under the 37.5M High fleet to 2.2 operations per day under the 37.5M High RJ fleet**; MD11 go from 17.9 operations per day to 4.2 operations per day; and the sum of 747, 757, 767, 777 and MD11 go from 269 operations per day under the 37.5M High fleet to 169 operations per day under the 37.5M High RJ fleet. Only the 767 and 777 show small increases; everything else decreases precipitously. (emphasis added). Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Runway 14/32	Analyze potential wind/weather use restrictions on Runway 14/32 and their impact on delay reduction, runway utilization, and PRAS achievement.	Massport's response is inadequate. Massport is unable to accurately determine the impact of potential restrictions on utilization of Runways 27 and 33 for

	▪ Determine impact of potential restrictions on utilization of Runways 27 and 33 for departures, PRAS achievement, and ability to reduce population exposed to the highest noise levels.	departures, PRAS achievement, and ability to reduce population exposed to the highest noise levels, since Massport has based its analysis upon false assumptions, undisclosed material facts, as well as, misleading, deceptive, and false information. Therefore, any summary of such existing analysis, itself is inherently deceptive and misleading. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Flight Track	Present enhanced flight track graphics on the same GIS base map used for the Brown Book noise contours, show individual tracks, extend into the South Shore, and show altitudes.	Massport's response is inadequate. The INM contours in the Supplemental DEIS/Final EIR are made using faulty assumptions and biased data. These flight tracks are contrary to fact and contrary to other published Massport data. The departure flight tracks supposedly used for the Supplemental DEIS/Final EIR are depicted in Figure 5.2-1 on page 5-15 of said document. In contrast, the 1999 ESPR published by Massport for Boston Logan International Airport (Logan) shows takeoff flight tracks for Runways 22L and 22R. (See 1999 ESPR for Logan, page F-5, Figure F-1-Jet Departure Flight Tracks. Some of the 1999 ESPR flight tracks go directly over the main part of the Hull peninsula. Similarly, RADAR plots provided by the Logan noise office at public meetings show takeoffs directly over the main part of the Hull peninsula. However, in direct contrast, the Supplemental DEIS/Final EIR (Figure 5.2-1, page 5-15) fails to show any departure flight tracks over the main part of the Hull peninsula. Rather, the Supplemental DEIS/Final EIR only shows flights over water. This omission of takeoff flights over the main part of the Hull peninsula is contrary to published Massport data and Massport RADAR plots, and it is contrary to fact. As a second example, the 1999 ESPR published by Massport for Boston Logan International Airport (Logan) shows landing flight tracks for Runways 33L. (See 1999 ESPR for Logan, page F-7, Figure F-2-Jet Arrival Flight Tracks) The flight track

		presented in the 1999 ESPR shows the jet aircraft flight track going directly over Hull in a perfect line with the extended Runway 33L centerline. Also, RADAR plots provided by the Logan Noise Office at public meetings generally show landings along a straight line that is an extension of Runway 33L centerline, a line that goes directly over Hull. In contrast, the Supplemental DEIS/Final EIR (Figure 5.2-2, page 5-17) fails to show any arrival flight track in a straight line over Hull. Rather, the Supplemental DEIS/Final EIR creates a large set of "assumed" landing flight tracks that primarily go west of Hull over water. The substitution of a large set of landing flight tracks that avoid Hull in place of a single flight track over Hull is contrary to published Massport data and Massport RADAR plots, and it is contrary to fact. Therefore, the enhanced flight track graphics presented by Massport are misleading, deceptive, and false. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Summary of Analysis	Incorporate a summary of existing analyses from the Draft EIS for Alternatives 1, 2, and 3 into the SDEIS in addition to the No Action (Alt.4) and Preferred Alternative (Alt. 1A).	Massport's response is inadequate. This analysis is based upon false assumptions, undisclosed material facts, as well as, misleading, deceptive, and false information. Therefore, any summary of such existing analysis, itself is inherently deceptive and misleading. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Demand Inducement	Analyze the potential for proposed infrastructure improvements (Runway 14/32 and taxiway improvements) and Peak Period Pricing to induce demand for Logan Airport.	Massport's response is inadequate. Massport has not provided any substantive analysis as to the proposed infrastructure improvements and PPP to induce demand for Logan Airport. By segmenting the Airside and Landside Improvement Projects, Massport has made any substantive analysis of the FAA's directive impossible. Only a cumulative

		analysis of the combined Landside and Airside Improvements would provide a meaningful response to this directive. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Noise	Compare current measured noise levels from monitors in residential neighborhoods to modeled results from the Integrated Noise Model (INM).	Massport's response is inadequate. Critical data to understand the Project and to understand the INM output and test assumptions are missing. The basic data and assumptions used to make noise predictions are not given. Specifically, Massport failed to provide; Daily numbers of daytime and nighttime takeoffs and landings by specific aircraft types; Typical flight path and runway geometry; and Average statistics on usage of each runway and flight path by various aircraft groups. This data is critical to the size and shape of the noise contour that is produced by INM. The assumptions one makes can greatly change the size and shape of the noise contours. For example, if one assumes that aircraft land and takeoff obliquely to the runway instead of in-line with the runway, then the noise predicted by INM "appears" in an erroneous area. Similarly, if one assumes a mix of very quiet aircraft such as small propeller aircraft in lieu of loud old jet aircraft, then the INM predictions will be too small. It is incumbent that the Supplemental DEIS/Final EIR provide sufficient detail so that one can run the INM and test the resulting calculations and the assumptions made. The necessary data to perform this function has not been provided by Massport. Moreover, the information provided in the Supplemental DEIS/Final EIR is insufficient, especially for the high RJ fleet Preferred Alternative, to understand or test assumptions or to independently run INM simulations. Massport has inexplicable omitted data from eight monitoring stations. Table 5.2-5 on page 5-29 of the Supplemental DEIS/Final EIR shows the full set of noise monitors operated by Logan Airport. But other tables like Table 6.2-11 on page 6-46

		of the Supplemental DEIS/Final EIR omits the following sites: Monitor 18 –Nahant; Monitor 19 – Swampscott; Monitor 20 – Lynn; Monitor 21 – Everett; Monitor 22 - Medford; Monitor 27 –Roxbury; Monitor 29 – Mattapan; and Monitor 30 - East Boston. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Miscellaneous	Address the following specific issues for which clarification has been requested: ▪ Provide data and discussion on predicted change in activity by runway end, including daytime and nighttime distribution.	Massport's response is inadequate. Massport has failed to provide an airspace design analysis for Runway 14/32, and has failed to produce an accurate fleet mix prediction for varying operational benchmarks. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Miscellaneous	Address the following specific issues for which clarification has been requested: ▪ Clarify discussion of proposed Centerfield Taxiway and its impact on the number of aircraft queuing on that taxiway and other taxiways waiting to depart.	Massport's response is inadequate. Massport failed to make any accurate predictions as to flight analysis and fleet mix. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.
Miscellaneous	Address the following specific issues for which clarification has been requested: ▪ Respond to written questions submitted by SDEIS Panel member, Mary Ellen Welch.	Massport's response is inadequate. They failed to provide a substantive detailed response to each individual comment. 17.104
School Year/ School Day Contour	Produce a school year/school day 65 dB contour for the Preferred Alternative for the 29M Low fleet. Research school day operating hours in relevant surrounding communities to determine the appropriate hours for the analysis.	Massport's response is inadequate. Massport failed to provide for meaningful research on schools within the surrounding communities. Massport failed to identify public and/or private schools and has systematically excluded all public and private schools from Hull, Hingham, Cohasset, Quincy, Milton, Brookline,

		Newton, Cambridge, Somerville, Everett, Malden, Chelsea, and Revere. Massport should revise the noise contours for over 1000 feet AGL. In addition, Massport should redo noise contours using true and correct data to ensure that all eligible homes are included (i.e. data regarding Hull) and redo data using realistic fleet mix. Once noise impacts are actually calculated a specific plan with earmarked funding should be developed for soundproofing houses, schools and other structures within the appropriate 65, 60, 55, 50, 45 noise contours in the Boston Metropolitan Area. The Supplemental DEIS/Final EIR noise contours are inconsistent with the Supplemental DEIS/Final EIR flight tracks. Figure 5.2-2 (page 5-17) of the Supplemental DEIS/Final EIR shows "Modeled Arrival Flight Tracks." Flight tracks for arrivals to Runway 33L are in line with the extended Runway 33L centerline from about 4 miles from the runway up to the threshold of the Runway. Figure F-2 on page F-7 of the 1999 ESPR published by Massport shows a single arrival flight track to Runway 33L that is precisely the extended Runway 33L centerline. Both the Supplemental DEIS/Final EIR and the 1999 ESPR note that differences between the 1999 ESPR and the Supplemental DEIS/Final EIR are small. Figure 6.2-9 on page 6-33 of the Supplemental DEIS/Final EIR compares the 1998 Annual Update contours with the 1999-29M Low No-Build prediction of the Supplemental DEIS/Final EIR. Also, Figure 6-3 of the 1999 ESPR shows the 1999 DNL noise contours for Logan. In both the 1998 Annual Update contours and in the 1999 ESPR contours, the "tips" of the noise contours going towards Hull follow the landing flight track to Runway 33L over Hull, the extended centerline of Runway 33L. However the "tips" of the 1999-29M Low No-Build prediction of the Supplemental DEIS/Final EIR (Figure 6.2-9 on page 6-33) drop approximately 5 degrees

		south of the landing flight track to Runway 33L over Hull, the extended centerline of Runway 33L. This is not an accidental discrepancy in just this figure; a similar discrepancy is evident in Figure 5.2-3 on page 5-21 of the Supplemental DEIS/Final EIR. This discrepancy that appears is simply not possible. The only simple explanation for this discrepancy is that the contours in the Supplemental DEIS/Final EIR were made with flight tracks other than those shown in the Supplemental DEIS/Final EIR or the contour generation otherwise deviates from the data given in the Supplemental DEIS/Final EIR. Massport's reference as to the location of the FAA's task, as contained in the "Location in Document", Table p-2 *Airside Project Additional Analyses for the Supplemental DEIS/FEIR, page P-14 to P-16* is vague, misleading, and fails to include any specific page reference.

3. PRIVATE CITIZEN COMMENTS

Pursuant to 301 CMR 11.07(l) of the MEPA Regulations the Final EIR shall include "a response to the certificate of the Secretary on the previous review document and each comment received on the previous review document, provided that the subject matter of the comment is within the Scope…". Not only has Massport failed to adequately respond to the Secretary's Scope as previously discussed, but also Massport has failed to adequately address substantive comments submitted by the public. Set forth below as an example of Massport's inadequate response to comments within the scope are the comments submitted by Stephen Lathrop, a member of the executive committee of the CAC and a private citizen of Hull. As clearly evident in the chart below, Massport's responses to Mr. Lathrop's comments are nonsensical, non-responsive and evasive. Massport's inadequate response to Mr. Lathrop's comments, as well as to the vast majority of other comments within the scope of the Secretary's Certificate is a serious violation of MEPA/NEPA regulations.

TOPIC	STEPHEN LATHROP'S COMMENT	MASSPORT'S RESPONSE	COMMENT
Environmental Review Process Code 279.1	...the time allowed for comment was too short to permit much of what I would have liked to research...2 weeks is not a reasonable time to develop researched rebuttal arguments following hearings. The difficulty in my case was compounded by the fact that no copy of the EIR was available at the Hull Public Library, apparently because none was ever provided there by Massport.	A copy of the Supplemental DEIS/FEIR will be available at the Hull Public Library.	Massport's response is inadequate. Given the short two week response period, Massports failure to acknowledge their violation of MEPA/NEPA circulation requirements is not cured by providing a copy of the Supplemental DEIS/FEIR after the comment period has expired. Moreover, to date Massport, although Massport has finally filed a copy of the DEIS/R at the Hull Public Library, Massport has failed to file a copy of the Supplemental DEIS/FEIR at the Hull Public Library
Noise Code 279.2	A Boston Globe report (March 2, 1999), based on Massport's projected data, shows that if Massport's new runway is approved, approximately 82,540 airplanes per year will fly low over Pemberton Point in Hull, the site of Hull High School. ...[Many] of these airplanes will fly within {1600 or} 1700 feet of the High School...[as] measured...from the school to the airplanes... Massport's Report presents tables which...seem to assert that under such conditions noise at Hull High School would then be equivalent to that experienced by residents of a "Small Town Cul-de-Sac."	Operations in the vicinity of Hull increase with the Preferred Alternative primarily due to aircraft landing to the northwest either on new Runway 32 or because of greater use of Runway 33L. However, the noise exposure levels resulting from these increased operations remains several decibels below 60 DNL as indicated by the specific point analysis at Site 26 in Tables 6.2-8, 6.2-9, 6.2-22, and E-1 of the Supplemental DEIS/FEIR. These levels are nearly 20 dB below the highest exposure in Winthrop and 15 dB below the exposure in parts of East Boston and Revere, which the new runway would help to improve.	Massport's response is inadequate. The computer predicted DNL levels for Hull are systematically biased low. The SDEIS/FIER predictions underestimate the true noise at Hull by at least 7 dB. In Appendix E (Volume 3) of the Supplemental DEIS/Final EIR, Table 6.2-11, entitled "Calculated Day-Night Sound Level Values in dB from Flight Operations for the 1999-29 Million Passenger Low Fleet", lists the Alternative 4 (No Action) 1999 prediction at the Hull monitor as 54.8 dB. In comparison, the 1999 ESPR (Table 6-6 on page 6-30) lists INM predicted DNL at the Hull monitor as 58.3 dB. That is, the 1999 Supplemental DEIS/Final EIR prediction for 1999 is 3.5 dB less than the actual 1999 ESPR value for 1999 at the Hull monitor. Moreover, the 1999 ESPR are based on 27.5M operations while the 1999 Supplemental DEIS/Final EIR are based on 29M operations. This difference amounts to an additional error of over 0.2 dB. Further, the companion report entitled "Current Noise Levels Generated at Hull by Logan Airport" shows that the actual measured airport only noise levels in 1999 at Hull were 61.2 dB. Therefore, including the 0.2 dB for the difference between using 27.5M and 29M as the number of operations, the 1999 Supplemental DEIS/Final EIR prediction underpredicts the true measured DNL at the Hull monitor by just under 7 dB. Note: an increase of 7 dB is equivalent to a fivefold increase in the number of aircraft operations.

			Moreover, the SDEIS/FEIR 1993 "Historical" prediction underestimates the true noise at Hull by 9 dB. Figure 5.2-3 on page 5-21 of the Supplemental DEIS/Final EIR Massport presents the predicted 1993 Historic DNL contours. The DNL at the Hull monitor is approximately 55 dB. The companion report entitled "Current Noise Levels Generated at Hull by Logan Airport" shows that the actual measured airport only noise levels in 1993 were 63.7 dB. That is, the 1993 Historical Supplemental DEIS/Final EIR prediction underpredicts the true, measured DNL at the Hull monitor by just under 9 dB. Note: an increase of 9 dB is equivalent to an eightfold increase in the number of aircraft operations. Further, compared with other sites, the SDEIS/FEIR DNL predictions for the Hull monitor are biased low. The Carey Circle monitor site in Revere is similar to Hull. Both sites are near water and have similar predictions based on the 1999 ESPR (Table 6-6 on page 6-30). In the 1999 ESPR, the INM predictions at Hull and at Carey Circle are 58.3 and 58.9 dB, respectively. In Appendix E (Volume 3) of the Supplemental DEIS/Final EIR, Table 6.2-11, entitled "Calculated Day-Night Sound Level Values in dB from Flight Operations for the 1999 – 29 Million Passenger Low Fleet", lists the Alternative 4 (No Action) 1999 prediction at the Hull monitor as 54.8 dB and at Carey Circle as 59.0 dB. That is, the 1999 predictions for the Supplemental DEIS/Final EIR and the 1999 ESPR are the same for Carey Circle but differ by 4 dB at Hull. Note: an increase of 4 dB is equivalent to a two and one-half fold increase in the number of aircraft operations.
Noise Code 279.3	The Draft Environmental Impact Statement/Report…fails to study noise impact in the vicinity of Hull…There are compelling reasons to believe that Hull meets the criteria for study established by Massport and by Federal regulations…[including: noise measurements at Hull High School that consistently exceed 60 dB and approach 60 dB in noise directly attributable to specific airport operations. Observations of aircraft indicate many low-altitude over flights, and near over flights, which are not presented in the report. Noise monitors in Hull Village consistently exceed 60 dB with no contributing factors except Logan Airport.	The Supplemental DEIS/FEIR projects that the Preferred Alternative would promote runway use in a manner that is more consistent with annual PRAS goals, and Hull is affected by the use of Runway 33/32 arrivals. The total number of aircraft arriving to the northwest does increase with construction of the runway, but this is due to the PRAS goals more than any other factor. Since the Runway 33 arrivals that impact Hull approach primarily over water, and since Hull is further from the airport than those communities impacted by arrivals to Runway 15L/R, 4L/R, or 22L/R, the PRAS goals call for 42 percent of the equivalent arrivals to operate in this direction. Runway 33 arrivals accounted	Massport's response is inadequate. In addition to the comments above, the assumptions in the SDEIS/FEIR regarding the aircraft fleet are inappropriate. The Supplemental DEIS/Final EIR appears to assume that all or nearly all of the large jet aircraft fleet will be true, Stage-3, quiet aircraft. None or nearly none of the larger jet aircraft are assumed to be Stage 2. This assumption is contrary to the expressed position of the United States Government from the President on down. The United States Government has consistently championed the right of U.S. carriers to fly retrofit Stage-2 aircraft for as long as they want to the

		for approximately 27 percent of the equivalent arrivals in 1998, and since Logan Airport has a limited capacity in this direction, the northeast configuration has been underutilized as demand has increased over the years. Construction of the runway allows better achievement of the agreed-upon PRAS goals, but even with Runway 14/32, the equivalent arrivals in the Runway 33/32 direction never reach the goal of 42 percent under any fleet scenario or alternative. Operations in the vicinity of Hull increase with the Preferred Alternative primarily due to aircraft landing to the northwest, either on new Runway 32 or because of greater use of Runway 33L. However, the noise exposure levels resulting from these increased operations remains several decibels below 60 DNL as indicated by the specific point analysis at Site 26 in Tables 6.2-8, 6.2-9, 6.2-22, and E-1 of the Supplemental DEIS/FEIR. These levels are nearly 20 dB below the highest exposure in Winthrop and 15 dB below the exposure in parts of East Boston and Revere, which the new runway would help to improve.	great consternation of the European Community. Although airport operators, including Logan, have expressed the desire to see the removal of retrofit Stage 2 aircraft from the fleet, there is no movement on the part of the United States Government or the Air Traffic Association in this direction. Therefore, Massport has no basis for assuming the elimination of retrofit Stage 2 aircraft from the fleet. The SDEIS/FEIR in the High RJ scenario assumes that the increase in RJ operations will coincide with a decrease in large jet operations. While it may be true that the RJs are used to replace some DC-9s, B727s, or MD80s as well as replacing small prop aircraft, it is inconceivable that EMB 145 (50 passenger commuter jet) will replace a B747 on a flight from Boston to London. However, in the Supplemental DEIS/Final EIR the High RJ Fleet shows a reduction of heavy jets like the B747 with a commensurate increase in RJ operations. Naturally, a RJ operation produces much less noise than does the B747 that it replaced. Specifically, B-747 go from 20.5 operations per day under the 37.5M High fleet to 2.2 operations per under the 37.5M High RJ fleet; MD11 go from 17.9 operations per day to 4.2 operations per day; and the sum of 747, 757, 767, 777 and MD11 go from 269 operations per day under the 37.5M High fleet to 169 operations per day under the 37.5M High RJ fleet. Only the 767 and 777 show small increases; everything else decreases precipitously. Also, the number of nighttime operations by Hull are biased low. Currently, in 1999 by Hull, 27.5 percent of landings on 33L are at night. Under the 37.5M High RJ fleet, this percentage drops almost in half to just 15.5 percent. The assumed percentage of nighttime operations on Proposed Runway 32 is only 8.8 percent; and this prediction is for a much more crowded and delayed airport. (Runways 32 and 33L are the "preferred" runways for nighttime landings). In contrast at Carey Circle, an area that is "not preferred" for nighttime operations, the percentage of nighttime landings goes from a current (i.e. 1999) percentage of 31.3 to 45.5 percent under the 37.5M High RJ fleet alternative. These types of faulty assumptions bias the data low by Hull.

Noise .4	Methods used by Massport to develop data for the Report are not sufficiently documented [including: representatives of flight tracks that are presented without adequate basis, representations of flight tracks over the beacon on Hull Peninsula, Flight paths with inexplicable dog leg patterns, omission of over-flights experienced in Hull, and failure to predict obvious noise effects]. This makes it impossible to assess…[whether] the data…accurately represents the cases they are claimed to represent…the methods used by Massport to process the data into noise models are [also] largely undocumented. The Report does not allow a reasonable person to assess whether the resulting noise models accurately reflect the data inputs. Some data presented in the Report could lead to a conclusion that the modeling software used by Massport lacks the sophistication…to model accurately the complex noise situation in the vicinity of Hull.	Refer to response to Comment 279.3.	Massport's response is inadequate. Massport continues to fail to provide the actual data necessary for a person to reasonably replicate Massport's analysis and studies. Moreover, the data presented by Massport in various tables and figures are inconsistent throughout the SDEIS/FIER and other documents published by Massport. By way of example: <u>Table 6.2-11 versus Figure 6.2-8</u> Table 6.2-11 on page 6-46 gives the predicted DNL at the Hull monitor as 55.6 dB for the 37.5M High fleet whereas Figure 6.2-8 on page 6-29 gives this value as about 59 dB – a discrepancy of 3 to 4 dB. Note: an increase of 3 dB is equivalent to a doubling of the number of aircraft operations. <u>Table 6.2-24 versus Figure 6.21 versus Table E.2</u> For the High RJ fleet, Table 6.2-24 on page 6-74 gives the predicted DNL at the Hull monitor as 55.7 dB for the 37.5M High RJ fleet whereas Figure 6.2-11 on page 6059 gives this value as about 60 dB – a discrepancy of 4 to 5 dB. This same value of 55.7 dB at the Hull monitor for the 37.5M High RJ fleet is replicated in Table E.1 of Volume 3 (no consistent page numbers) of the SDEIS/FEIR gives the nighttime equivalent level at the Hull monitor as 58.3 dB. But this nighttime equivalent level using standard operations, calculated to a DNL that is at least 64 dB before adding in the daytime noise. With daytime noise, the DNL at the Hull monitor according to this table for the 37.5M High RJ fleet is 65 dB – a discrepancy of almost 10 dB between Table E.1 or Table 6.2-24 and Table E.2. Note: an increase of 10 dB is equivalent to a tenfold increase in the number of aircraft operations. In summary, there are three different values for the 37.5M High RJ fleet DNL prediction at Hull in the SDEIS/FEIR, two in tables and one in a figure. All should be the same. All are different. The difference from the smallest to the largest is almost 10 dB. Similar discrepancies are present for the 37.5M High fleet. It is simply impossible to make any sense of a report that has such glaring discrepancies for critical information like the predicted noise levels.

Noise .5	A representative of Massport and of the Federal Aviation Administration have offered the prospect that future technological improvements would facilitate more efficient noise abatement in the vicinity of Hull. [For instance, using GPS to guide incoming flights along curved flight paths and installation of guide slope and locator electronics on Thompson Island to assist in off-setting approach paths, by more than 1 mile to the north.] The Report does not discuss such future improvements and it seems reasonable to believe that implementation of the Preferred Alternative would complicate or preclude their implementation.	Use of GPS in both arrival and departure procedures is beginning to be utilized but is still a relatively new technology. When it does come into wider use (both as instrumentation onboard the aircraft as well as in published procedures used by Air Traffic Control), it may well allow more versatile routing of traffic north of Hull. However, it is not a part of this assessment.	Massport's response is inadequate. Massport failed to consider the GPS/WAAS (Global Positioning System/Wide Area Augmentation System), which will be available within the time frame of the planning of this Project. These systems will bring to the United States the improved efficiency in landings which are currently achieved in Europe through the implementation of MLS (Microwave Landing System).
Noise 279.6	It seems reasonable to suppose that construction of Runway 14/32 would alter existing patterns of aircraft operations...the Report asserts that jet operations in the vicinity of Hull will continue to follow the tracks they have used historically, except that new tracks will be added to the west of the present inbound approach to Runway 33L. [Based on FAA tracking data, it appears that the new runway configuration would result in different approach paths, increasing approaches from the east and affecting Hull more.]	Operations in the vicinity of Hull increase with the Preferred Alternative primarily due to aircraft landing to the northwest, either on new Runway 32 or because of greater use of Runway 33L. However, the noise exposure levels resulting from these increased operations remains several decibels below 60 DNL as indicated by the specific point analysis at Site 26 in Tables 6.2-8, 6.2-9, 6.2-22, and E-1 of the Supplemental DEIS/FEIR. These levels are nearly 20 dB below the highest exposure in Winthrop and 15 dB below the exposure in parts of East Boston and Revere, which the new runway would help to improve.	Massport's response is inadequate. See comment 279.2 and 279.3.
Environmental Review Process 279.7	The people of Hull have not been adequately notified of Massport's plans regarding Runway 14/32, nor have they had sufficient opportunity or time to respond to the Report. [The Report was not made available to the Hull Library.]	The Supplemental DEIS/FEIR will be available at the Hull Public Library. Everyone who wrote a comment letter will be notified of the availability of the Supplemental DEIS/FEIR.	Massport's response in inadequate. To date Massport has failed to file the Supplemental DEIS/FEIR at the Hull Public Library in violation of MEPA/NEPA circulation requirements.

V. SEGMENTATION

A. The Federal Aviation Administration and the Massachusetts Port Authority's Fragmentation of Airside and Landside Projects That Are Connected, Cumulative, and Similar Actions Into A Series of Separate Project Reviews Constitutes A Segmented Review Under The National Environmental Policy Act, 42 U.S.C. §§4321-4347 and The Massachusetts Environmental Policy Act, M.G.L. Ch. 30 §§ 61-62H.

17.105

The Massachusetts Port Authority ("Massport") and the Federal Aviation Administration ("FAA") have segmented functionally linked Airside and Landside Projects in order to evade any meaningful cumulative environmental review.

1. The Logan Airside and Landside Projects are interdependent and functionally linked and must be evaluated in a cumulative and comprehensive environmental impact statement/report.

In the DEIS/R and Supplemental DEIS/ Final EIR for the Logan Airside Improvements Planning Project, the FAA and Massport propose, under the Preferred Alternative, to construct a new unidirectional Runway 14/32, a new centerfield taxiway, reconfigure certain taxiways, as well as other non-structural alternatives. These Airside Projects are designed to facilitate and stimulate demand by improving aircraft operations and movement, particularly aircraft landings, takeoffs, and movement.

Massport has concurrently identified or implemented approximately Twenty-Seven (27) landside terminal and service area projects, which support the Airside operations and accommodate growth by moving passengers to and from aircraft and to and from Boston-Logan International Airport. The Generic Environmental Impact Report 1994 and 1995 Annual Updates, The Boston-Logan International Airport 1996 Annual Update, The Boston-Logan International Airport 1997 Annual Update, The Boston-Logan International Airport 1998 Annual Update, and the Boston-Logan International Airport 1999 Environmental Status & Planning Report identify the following Twenty-Seven (27) Landside Projects:

1. The Jet Fuel Storage Facility;
2. International Gateway;
3. United Airlines Terminal C Improvements;
4. Central Garage Modifications;
5. Central Heating/Cooling Plant Upgrades;
6. West Garage Improvements;
7. Terminal E Modernization;

8. West Garage Project- Elevated Walkways and Terminal Roadways;
9. Central Garage Modifications;
10. International Gateway/ Federal Inspection Services;
11. Airport Intermodal Transit Connector;
12. Terminal A Replacement;
13. Jet Fuel Distribution System;
14. U.S. Airways Terminal B Improvements and Construction;
15. United Airlines Terminal C Improvements;
16. American Airlines Terminal B Improvements;
17. Various Service Area Projects;
18. Replacement and/or Permanent Gas Stations;
19. Ground Service Equipment Replacement Facilities;
20. Replacement Cargo Facilities;
21. Hangar Support Facilities;
22. Renovation and Consolidation of Flight Kitchens;
23. Consolidation of Rental Car Facilities;
24. Relocation of the Park N' Fly Facility;
25. Relocation of the Bus and Limousine Pool;
26. Construction of Cargo Building 63; and
27. Relocation of the United States Post Service Facility.

Massport has identified or constructed such landside terminal and service area projects in order to expand the capacity of Logan's terminals and terminal access areas, and to address the problems of "terminal overcrowding, roadway congestion, and inadequate parking". *See Draft Environmental Impact Statement/ Report, Page 7-6.*

Logan's airside and landside projects are interdependent and have one common purpose, to upgrade and prepare Logan to handle projected future growth in passenger demand and support. Virginia Buckingham, Executive Director and CEO of Massport, stated at the December 4, 2000 SDEIS Panel Meeting that Logan's primary focus for the future will be on "long-haul and international service". *See Boston-Logan International Airport Supplemental Draft EIS (SDEIS) Panel Minutes, December 4, 2000.* In order for Massport to prepare for this increased impact, Buckingham failed to mention any Airside improvements and cited only the Landside improvements, namely the renovation of International Terminal E, replacement of Terminal A, a New West Parking Garage, Elevated Walkways to all terminals, and Improved Ground Access. *Id.*

All Landside and Airside Projects are being designed, constructed, and implemented in the same physically constrained Two Thousand Four Hundred (2,400) acre footprint. *See Boston-Logan International Airport 1999 Environmental Status & Planning Report, Page 1-2.* The location and design

requirements for all Airside and Landside Projects, given such limited space, preclude or affect alternatives for all projects. However, such location and design constraints cannot be understood when they are intentionally bisected into Generic Environmental Impact Reports/Environmental Status & Planning Report components and then further segmented into multiple Environmental Impact Reports/ Statements on interdependent projects that have cumulative environmental impacts. Although all projects are purportedly incorporated in the General Environmental Impact Report/Environmental Status & Planning Report processes, the complexity and diversity of discrete projects that have a cumulative environmental effect defies accurate interdependent analysis. For example, to reduce overall delay for air travelers, it is critical not to expand either landside or airside capacity without a balanced coordinated, cumulative environmental review of both the Airside and Landside Projects. Inadequate funding or either staggered or delayed implementation by Massport and the FAA could easily preclude and/or limit the ability to finance and implement any or all of the Air or Landside Projects and related mitigation measures. In such event, the inter-related delay reduction and pollution benefits, as set forth in individual Section 61 Findings, could then be canceled or reversed, causing the projects that advance to result in both delay and pollution. The cumulative impacts from the Landside and Airside Projects upon ecosystems, air and water quality, the coastal zone, and soil, as well as the environmental effects from noise and construction impacts can only be assessed in a single comprehensive Environmental Impact Statement/ Report which focuses upon this interdependence between the Airside and Landside Projects and incorporates Section 61 Findings under the Massachusetts Environmental Policy Act. A final determination would then only be made after examining the cumulative environmental impact of inter-related Airside and Landside Projects.

Massport has completely disregarded *The Council on Environmental Quality NEPA Regulations,* 40 C.F.R. § 1508.25 and Paragraph 26 of FAA Order 5050.4A, Airport Environmental Handbook, dated October 8, 1985 ("Airport Environmental Handbook"), which require a Comprehensive Environmental Impact Statement for cumulative and connected actions. *The Council on Environmental Quality NEPA Regulations,* 40 C.F.R. § 1508.2, require the analysis of direct, indirect, and cumulative impacts from connected, cumulative, and similar actions. The landside and airside actions are closely related, automatically trigger other actions, are interdependent parts of larger dependent actions, and should therefore be discussed in the same Environmental Impact Statement/Report. 40 C.F.R. § 1508.25(a)(1)-(3). When the Airside Project is viewed with other proposed and implemented landside actions, the interrelated airside and landside projects have cumulatively similar impacts. 40 C.F.R. § 1508.25(a)(1)-(3).

Paragraph 26(c.) of the Airport Environmental Handbook requires that FAA and Massport consider the cumulative environmental impacts that an initial runway extension and any reasonably foreseeable "second phase extension". Curiously, FAA and Massport have omitted the eventual "second phase extension" of the purported unidirectional 5,000 foot Runway 14/32, which could transform an underutilized 5,000 foot runway into a 7,000 - 8,000 foot Runway 14/32 to accommodate Logan's primary vision for "long-haul and international service". *See Boston-Logan International Airport Supplemental Draft EIS (SDEIS) Panel Minutes, December 4, 2000.*

2. Massport and the Federal Aviation Administration's Segmented Approach to the Inter-Related Airside and Landside Projects Prevents any Meaningful Broad Scale Analysis, or Comprehensive Environmental Review.

Massport and FAA have abrogated their obligation to perform a Comprehensive Environmental Impact Statement/Report on the interrelated Airside and Landside Expansion Projects and have attempted to replace this requirement by incorporating the 1994/1995 Annual Updates, Generic Environmental Impact Report, 1996 Annual Update, 1997 Annual Update, 1998 Annual Update, and the 1999 Environmental Status and Planning Report into the DEIS/EIR and in the Supplemental DEIS/FEIR as purported "background" documents. *See The Draft Environmental Impact/Report for the Logan Airside Improvements Project, Volume I, Page P-6; Response to Comment 6.18, Draft Environmental Impact Statement/Report; Response to Comment 193.17, Supplemental Draft EIS.* Massport has not presented any original broad-based analysis and generic overview of the interrelated Land and Airside Projects. Instead, Massport has relied exclusively upon the Generic Environmental Impact Reports/ Environmental Status & Planning Reports to provide a broad-scale analysis and overview of all improvement projects and their relationship to Logan. The Generic Environmental Impact Report/Environmental Status & Planning Report process ("GEIR/ESPR Process"), upon which Massport and the FAA rely to fulfill their obligation to perform a cumulative environmental impact Statement/Report, does not incorporate or require any Section 61 Findings under the Massachusetts Environmental Policy Act and 301 C.M.R. 11.01(4)(c). Unlike the EIR process, the GEIS/ESPR process has no substantial standard and no equivalent Section 61 Findings to make the Proponent accountable and to provide direction to permitting any other regulatory agencies. In fact, the GEIR/ESPR process fails to specify any cumulative feasible means to be used to avoid cumulative damage to the environment and the extent to which cumulative damage to the environment cannot be avoided, minimized, or mitigated to the maximum extent practicable. The GEIR/ESPR process has no substantive standard to ensure that cumulative environmental impacts are examined and that

Section 61 Findings are made. Massport and the FAA have manipulated the GEIR/ESPR process to evade review of the cumulative impacts from the Landside and Airside Projects. Such evasion nullifies the National Environmental Policy Act and the Massachusetts Environmental Policy Act's twin goals of providing a meaningful opportunity for public review of detailed cumulative environmental impacts. *See* Inland Empire Pub. Lands Council v. United States Forest Serv., 88 F. 3d. 754, 760, n.5 (9th Cir. 1996); and 301 C.M.R. 11.01 (4)(c).

FAA and Massport purport to adopt by reference all of the documents, reports, assumptions, and data on the environmental impacts associated with the landside and airside operations as addressed in: the Generic Environmental Impact Report 1994 and 1995 Annual Updates, and the corresponding environmental studies, environmental policy and planning, MEPA Documents, and Technical Appendices; the Boston-Logan International Airport 1996 Annual Update and Supporting Documentation; the Boston-Logan International Airport 1997 Annual Update; the Boston-Logan International Airport 1998 Annual Update; and the Boston-Logan International Airport 1999 Environmental Status & Planning Report. *See The Draft Environmental Impact/Report for the Logan Airside Improvements Project, Volume I, Page P-6; Response to Comment 6.18, Draft Environmental Impact Statement/Report; Response to Comment 193.17, Supplemental Draft EIS.* These documents alone constitute Ten (10) Volumes of reports, assumptions, data, comments, and responses amounting to approximately Four Thousand, Four Hundred and Sixty-Five (4,465) pages.[66] Massport incorporates the entire 4,465 pages by reference and rely upon them as "background document(s)" without any specific reference or directive to the location of applicable data or analysis either by study, volume, page, table or appendix. *See The Draft Environmental Impact/Report for the Logan Airside Improvements Project, Volume I, Page P-6; Response to Comment 6.18, Draft Environmental Impact Statement/Report; Response to Comment 193.17, Supplemental Draft EIS.* Most disturbing, when asked, representatives from both the Aviation Planning Department of Massport and the Environmental Programs from the Federal Aviation Administration's New England Region were unable to identify or reference, with any specificity, which, if any, of the 4,465 pages of documents, reports, assumptions, data, comments, or responses, that have been incorporated by reference, address the cumulative environmental impacts from the Airside and Landside Projects. Even more disturbing, there is no mention of the ten (10) volumes incorporated by reference nevertheless a reference or directive

[66] The Generic Environmental Impact Report 1994 and 1995 Annual Updates, and the corresponding environmental studies, environmental policy and planning, MEPA Documents, and Technical Appendices is approximately 2,462 pages; the Boston-Logan International Airport 1996 Annual Update and Supporting Documentation is approximately 882 pages; the Boston-Logan International Airport 1997 Annual Update is approximately 222 pages; the Boston-Logan International Airport 1998 Annual Update is approximately 383 pages; and the Boston-Logan International Airport 1999 Environmental Status & Planning Report is approximately 516 pages.

to a single page is made in Section 1.7.1 of the Supplemental DEIS/Final EIR in "NEPA/MEPA History of the Airside Project", or in page P-2 of the Supplemental DEIS/Final EIR in the "Organization of this Supplemental Draft EIS/Final EIR".

Massport's failure to cite any of the documents, reports, assumptions, and data specifically relied upon in either the Draft EIS/EIR and/or the Supplemental DEIS/Final EIR severely impedes and effectively prohibits meaningful agency and public review of the proposed action as implemented by *The Council on Environmental Quality NEPA Regulations,* 40 C.F.R. § 1502.21 and *Paragraph* 89 of FAA Order 5050.4A, *Airport Environmental Handbook, dated October 8, 1985.* As a result, it is impossible for any federal or state agency, let alone any municipalities, interest groups, or citizens, to identify, analyze, or understand the cumulative environmental impacts from the Airside and Landside Projects.

The Secretary should find that Massport and the FAA's fragmented review of the Airside and Landside Projects, which are connected, cumulative, and similar actions, constitutes a segmented review under the Massachusetts Environmental Policy Act, M.G.L. Ch.30, §§ 61-62H, and that such segmented approach to interrelated Airside and Landside Projects prevents any meaningful broad scale analysis or comprehensive environmental review. Therefore, the Secretary should require Massport to implement a Programmatic Review to address airside and landside cumulative environmental impacts, pursuant to 301 Code of Massachusetts Regulations 11.09 (4)(a), and file a new Environmental Notification Form, pursuant to 301 Code of Massachusetts Regulations 11.05, and a new Environmental Impact Statement, pursuant to 301 Code of Massachusetts Regulations 11.07, consistent with such Programmatic Review. Alternatively, the Secretary and the Federal Aviation Administration should find that Massport and the FAA's failure to identify, cite, or reference any of the Ten (10) volumes of documents, reports, assumptions, data, comments, and responses amounting to approximately Four Thousand, Four Hundred and Sixty-Five (4,465) pages severely impedes all agency and public review of the proposed action and is violative of the Massachusetts Environmental Policy Act and the National Environmental Policy Act's procedural requirements. *See The Council on Environmental Quality NEPA Regulations,* 40 C.F.R. § 1502.21; *Paragraph* 89 of FAA Order 5050.4A, *Airport Environmental Handbook, dated October 8, 1985; and 301 C.M.R. 11.07(6)(m).* Therefore, alternatively, pursuant to 301 CMR 11.08 (8)(c) the Secretary should determine that the Final Environmental Impact Report is inadequate, and require Massport to file a Supplemental Final Environmental Impact Report with detailed citations and references to any material incorporated into the Supplemental FEIR, and include such material in the Appendix of the Supplemental Final Environmental Impact Report.

VI. NOTICE OF PROJECT CHANGE

At the time Massport filed the Draft EIR, Massport also filed a Notice of Project Change based upon the three-year lapse of time since filing the ENF.[67] Massport requested in a letter to the Secretary that a determination be made that no further review was required for the change. The Secretary, after considering the documents and comments in light of the factors set forth in 301 CMR 11.10(6) of the MEPA Regulations, determined that any issues arising out of the lapse of time could be adequately addressed in the Final EIR or the GEIR.

After a thorough review of the Supplemental DEIS/Final EIR, we respectfully request that the Secretary consider these comments a new, additional Notice of Project Change pursuant to 301 CMR 11.10(5) of the MEPA Regulations and require Massport to repeat all phases of the Logan Airside Improvements Planning Project MEPA review based on the following grounds:

1. Massport has concealed material facts and submitted false information during the MEPA review process, including the Notice of Project Change review which it filed;

2. Massport failed to adequately address the issues that have arisen as a result of the lapse in time, and after reconsideration of the factors set forth in 301 CMR 11.10(6), the change in the Project and lapse of time significantly increase the environmental consequences of the proposed Project; and

3. Massport is seeking to increase the capacity of Logan from its existing 105 operations per hour of sustainable capacity and has unlawfully, and in bad faith, segmented the Project between landside and airside improvements.

A. Massport knowingly submitted false information during MEPA review, and therefore the Secretary should determine that a Project Change has occurred.

- Massport has added a new alternative, Alternative 1A, during the lapse of time and has failed to fully and accurately analyze its environmental impacts.

- Massport utterly failed to do any air quality analysis for its Preferred Alternative 1A.

- Massport manipulated the noise model, data inputs and contours, causing the contours to be wrong by a factor of 900-1000%.

- Massport manipulated the dispersion model; as a result the emissions are underestimated by 150-200%.

[67] See Appendices N and O.

- Massport failed to accurately calculate the Regional Jet Fleet, thereby manipulating the Delay-Sim Model.

- Massport's airspace calculations are wrong due to the failure of Massport to prepare an airspace design.

- All of Massport's data is tainted due to Massport's failure to identify the coordinates of the proposed runway.

- The elimination of Peak Period Pricing in the Preferred Alternative reduces the environmental and delay benefits of the Project.

- Massport failed to do a cost analysis benefit, and therefore failed to accurately determine whether investment is necessary and, if so, to what degree.

- Due to Massport's failure to accurately depict the Regional Jet Fleet, the delay and pollution benefits of the proposed runway are reduced or possibly even eliminated.

B. **The lapse in time has significantly increased the environmental consequences of the Project.**

301 CMR 11.10(6) sets forth the factors that the Secretary shall consider in determining whether a change in a Project or a lapse of time might significantly increase environmental consequences. We respectfully submit that the Secretary should consider the following:

a. Expansion of Project: The square footage and linear footage and acreage of the proposed runway have been increase by over 10%. 17.106

b. Generation of Further Impacts:

- Massport's noise model, data inputs and contours are wrong by a factor of 900-1000%.

- Emissions were underestimated by 150-200% due to Massport's manipulation of the dispersion model.

- The DELAYSIM model is inaccurate due to Massport's failure to accurately calculate the changes in the fleet mix for the 29M, 33M and 37.5M scenarios.

- Airspace calculations are inaccurate due to the failure of Massport to prepare a preliminary airspace design.

- All of Massport's impact data is inaccurate due to Massport's failure to identify the coordinates of the proposed runway.

- The elimination of Peak-Period Pricing in the Preferred Alternative reduces the environmental and delay benefits of the Project.

- The delay and pollution benefits of the proposed runway are reduced or possibly eliminated by the changes in the Regional Jet Fleet.

c. Change in Project Schedule: Due to the change in the schedule of MEPA completion by 1997 to the completion of MEPA in 2001, and commencement of the Project in 2003, the following significant environmental impacts occur:

- Radical change in the fleet mix with the elimination of the majority of turbo props and their replacement with Regional Jets.

- Increase in the population impacted by the Project as based on the 2000 Census, which has not been considered by the Project.

- The failure to realize the benefits of Massachusetts Transit Landside Improvements.

- The impact of successful growth of regional air transportation.

- The institution and impacts of Acela and other rail projects that can serve as an alternative to Logan expansion.

- Completion of the cleanup of Boston Harbor and the resulting dramatic increase in Boston Harbor utilization as a recreational area.

- Availability of particulate data from air quality monitors.

- The failure of the Philadelphia 5000-foot runway.

- The lack of use of the BWI 5000-foot runway.

- The new EPA ozone and particulate air quality standards.

- The failure of Massachusetts to comply with the State Implementation Plan (SIP) regarding prior, less restrictive, ozone standards.

- The decrease in the rate of growth of air passengers at Logan.

- The advancement in navigational technologies and the expense of Europe with the advanced technologies.

d. Change of Project Site: The exact coordinates for the proposed runway have not been set, and the Project has been expanded to include as an option the partial filling or decking over Boston Harbor.

e. Failure of Massport to include Peak Period Pricing and failure of Massport to promote regionalization with such concrete measures such as opening up Massport's Shuttle Express lots to shuttles from other airports has delayed substantial environmental benefits greater than what is set forth in the Preferred Alternative.

Given the significant and material negative environmental consequence of the changes that have occurred as set forth above, we respectfully request that the Secretary order the Proponent to file a new ENF and to repeat the MEPA review process for Project EOEA #10458.

VII. REQUESTED ACTION

Based on the preceding comments we respectfully request that Secretary Durand and Administrator Garvey take the following action:

1. Project Change

A. We respectfully request that Secretary Durand order the Proponent to file a new ENF and to repeat the MEPA review process for Project EOEA #10458, based on the following grounds:

- Massport has concealed material facts and submitted false information during the MEPA review process, including the Notice of Project Change review which it filed;

- Massport failed to adequately address the issues that have arisen as a result of the lapse in time, and after reconsideration of the factors set forth in 301 CMR 11.10(6), the change in the Project and lapse of time significantly increase the environmental consequences of the proposed Project;

- Massport is seeking to increase the capacity of Logan from its existing 105 operations per hour of sustainable capacity and has unlawfully, and in bad faith, segmented the Project between landside and airside improvements; and

- As a result, the lapse in time and change in the Project have significantly increased the environmental consequences of the Project.

2. Delay Analysis

A. We respectfully request that Secretary Durand find that Massport omitted material facts, and therefore, the Secretary should require Massport to file a new ENF on the following grounds:

- The delay results are particularly sensitive to the percentage of operations by regional jets, as shown in the 37.5M High RJ scenario. It appears that Massport and the FAA make relatively optimistic assumptions about regional jet use of Proposed Runway 14/32, which is only 5,000 feet long. The Supplemental DEIS/Final EIR does acknowledge that the minimum landing distances will likely exceed 5,000 feet under wet conditions, however, it fails to report on the minimum landing conditions for higher temperatures or higher humidity days, which may increase required runway lengths beyond 5,000 feet, and thus adding to the reality that Proposed Runway 14/32 may not decrease delays to the extent represented by Massport.
- While many parts of the analysis and some assumptions are disclosed, they are often disclosed in separate documents representing work at different time periods with subsequent adjustments. However, Massport does not fully disclose the inner workings of the models they used in their delay analysis. Moreover, nowhere in any of the reviewed documents is there a concise description of the key assumptions made about capacity under the various configurations, how aircraft are assigned to operate or specific runways when these configurations are in use, and how the resultant delays, if any, have been estimated.

- The DELAYSIM model simulates how controllers assign aircraft to runways under specific weather conditions and with the objective of meeting goals under the Preferential Runway Advisory System (PRAS) program for Logan. However, nowhere in the documents reviewed, does Massport disclose the proportion of such operations assigned to each runway or the methodology by which this is done. Rather, all Massport presents in the documentation are the results of such assignments. Therefore, it is not possible to know whether there were other feasible assignments of aircraft to runways that produce greater benefits.

- The data presented by Massport are manipulated within the DELAYSIM model to reflect controller compliance with PRAS, however, one cannot relate the specific inputs to the outputs produced in terms of delay, runway utilization and so forth. Massport failed to present any detailed data as to how runway assignments under PRAS were made, and at which point controllers shift from one airfield configuration to another.

B. Alternatively, we respectfully request that Secretary Durand and Administrator Garvey find the Supplemental DEIS/Final EIR inadequate and require Massport to file a Supplemental DEIS/Supplemental Final EIR with an expanded scope compelling Massport to:

- Include all of the data and input parameters used in the DELAYSIM model so that the public would have the opportunity to understand how the delay estimates were prepared and to determine the reasonableness of Massport's delay analysis; and

- Redo its delay simulations using the true and accurate fleet mix at Logan, as set forth in airline specific manuals, and including in their analysis the minimum landing conditions of the regional jet fleet using Logan, as well as the minimum landing distances under various conditions, such as wet surfaces, high temperatures, high humidity and so forth.

3. Air Quality

A. We respectfully request that Secretary Durand find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF based on the following grounds:

- Massport failed to provide and/or present any air quality analysis for the Preferred Alternative;

- Massport incorrectly based its claim that air emissions benefits will be attained with the construction of proposed Runway 14/32 on theoretical mass-based air emission calculations and comparisons for two future emission scenarios;

- Massport detrimentally relies on its incorrect calculations and comparisons to claim that the proposed project is not regionally significant, not subject to federal conformity determinations, and is presumed to conform with State Implementation Plan (SIP) requirements;

- Massport arbitrarily cuts off emissions at 3,000 feet, thus omitting any adverse impact of emissions above 3,000 feet, which causes Massport to underestimate air emissions from Logan by up to 150%;

- Massport arbitrarily cuts off emissions at 3,000 feet, thus failing to take into account emissions that travel into a Class 1 Air quality Zone (i.e. Maine) and the effects it has in that area (i.e. visibility);

- Massport has failed to address how they will comply with Revised Ambient Air Quality Standards;

- The FAA's determination that the Preferred Alternative conforms with the Clean Air Act is erroneous; and

- The FAA's determination that the Preferred Alternative conforms to the Massachusetts State Implementation Plan (SIP) is erroneous.

B. Alternatively, we respectfully request that Secretary Durand and Administrator Garvey find the Supplemental DEIS/Final EIR inadequate and require Massport to file a Supplemental DEIS/Supplemental Final EIR with an expanded scope compelling Massport to:

- Redo its air quality emissions analysis using the Preferred Alternative 1A, not Alternative 1;

- Compare actual emissions and observed concentrations from the current time period to projected incremental impacts;

- Set forth an actual baseline case for its air emissions analysis;

- Analyze emissions at varying levels up to 6500 feet;

- Analyze the positive and negative impacts, if any, of the Preferred Alternative on Class 1 areas; and propose a mitigation plan, if after a true and accurate analysis of air quality impacts of the Preferred Alternative, it is determined that implementation of the Preferred Alternative will negatively impact Class 1 areas; and

- Include in its analysis their plan to comply with the revised ambient air quality standards; and set forth their commitment to comply with state and federal ambient air quality standards now and in the future.

4. Noise

A. We respectfully request that Secretary Durand find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF based on the following grounds:

- Critical data to understand the Project and to understand the INM output and test assumptions are missing;

- The basic data and assumptions used to make noise predictions are not given;

- Massport presents the actual noise monitor data, however they do not use the actual data in their analysis. They failed to make any substantive use of the actual noise monitor data;

- Massport has provided insufficient information as to how or where aircraft fly when they land on Proposed Runway 32, moreover Massport fails to provide any explanation or discussion of how fixed wing aircraft can land based on the INM computer simulation assumption of an oblique angle approach;

- Critical tabular data are missing, due to Massport's omission of data from several noise monitors. No explanation is given for the omission of data for these sites;

- A whole operational scenario has been deleted from the Supplemental DEIS/Final EIR. The Draft EIS contained a runway configuration with simultaneous landings on Runways 32 and 27, and with takeoffs on Runway 33L. This appears to be a very efficient set of runways since the smaller and larger aircraft can be well separated on landings. Also, many of the aircraft taking off on 33L can do so after the intersections of Runways 33L and 27 so that there is no conflict. This runway configuration was omitted from the Supplemental DEIS/Final EIR;

- The INM contours in the Supplemental DEIS/Final EIR are made using faulty assumptions and biased data;

- The Supplemental DEIS/Final EIR noise contours are inconsistent with the Supplemental DEIS/Final EIR flight tracks;

- The assumptions in the SDEIS/FEIR regarding the aircraft fleet are inappropriate. The Supplemental DEIS/Final EIR appears to assume that all or nearly all of the large jet aircraft fleet will be true, Stage-3, quiet aircraft. None or nearly none of the large jet aircraft are assumed to be Stage 2. Massport has no basis for assuming the elimination of retrofit Stage 2 aircraft from the fleet and has no power to force such a change.

- The noise contours do not go low enough in level to adequately describe the true impacts, as documented in the GAO and Schomer studies.

- The use of a DNL criterion of 65 dB is simply outmoded and unacceptable;

- The data presented by Massport in its various tables and contours are inconsistent throughout the Supplemental DEIS/Final EIR;

- The Supplemental DEIS/Final EIR prediction underestimates the true noise in Hull by 7 dB;

- The 1993 SDEIS/FEIR "historical" prediction underestimates the true noise in Hull by 9 dB;

- The 37.5 M High RJ Fleet DNL at Hull may be 73 dB; and

- The number of nighttime operations by Hull are biased low;

B. Alternatively, we respectfully request that Secretary Durand and Administrator Garvey find the Supplemental DEIS/Final EIR inadequate and require Massport to file a Supplemental DEIS/Supplemental Final EIR with an expanded scope compelling Massport to:

- Redo all of its noise data from the beginning;

- Use true and correct data, i.e. actual flight track information, actual Monitor measurements, etc., rather than false and misleading information;

- Present all data positive or negative;

- Reanalyze data using all significant data as pointed out by the Secretary and Commentators rather than simply presenting information requested in the scope and comments without any meaningful substantive analysis;

- Redo its tables and contours so that they are consistent in the information presented; and

- Present the data in a clear and easy to understand format that would permit the public to review and understand the material and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate the Massport INM modeling results and test the underlying assumptions.

5. Peak-Period Pricing

A. We respectfully request that Secretary Durand find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF based on the following grounds:

- Massport states the conclusion it wants without establishing the factual baseline necessary for any accurate analysis. In the case of peak-period pricing and their decision to build Proposed Runway 14/32 before the implementation of peak-period pricing, Massport has failed to conduct the cost-benefit analysis necessary for an economic factual baseline;

- Massport recommends that congestion pricing be considered after the runway is built. It is difficult to understand why a runway investment would be a successful strategy under certain conditions of aircraft demand, but that congestion pricing would not be successful under these same conditions;

- Massport shows that peak-period pricing does produce delay savings, however they are shown to be less than building a new runway. However, this analysis is misleading due to Massport's manipulation of the sequencing. If pricing were implemented first, followed by runway investment (i.e. the generally accepted sequencing), the benefits from pricing would be higher than if the sequencing were done in the reverse. That is, the marginal benefits from reduced delay from pricing are less after a runway is built than before a runway is built. Even where analysis calls for both pricing and investment, efficient prices are the first policy put in place;

- The technical foundations for Massport's findings and conclusions are impossible to assess accurately. Massport claims to have analyzed peak-period pricing and its effects, but it is not clear how this was done; and

- The conceptual basis for peak-period pricing and how these prices were constructed was not discussed, so it is impossible to assess accurately what the findings are actually measuring. Similarly, without a detailed description of the model, its parameters, and assumptions, it is impossible to assess accurately the findings on the effects of building a new runway, including what, if any, delay reduction benefits a new runway would provide.

B. Alternatively, we respectfully request that Secretary Durand and Administrator Garvey find the Supplemental DEIS/Final EIR inadequate and require Massport to file a Supplemental

DEIS/Supplemental Final EIR with an expanded scope compelling Massport to:

- Conduct a comprehensive cost benefit analysis of each proposed capital investment, including Runway 14/32, in comparison to each congestion pricing variation and operational management alternative.

- Redo its analysis of peak-period pricing, by using the standard analysis of implementing peak-period pricing first and then consider investment options; and

- Disclose a detailed description of the model, its parameters, and assumptions, so it is will be possible to assess accurately the findings on the effects of building a new runway, including what, if any, delay reduction benefits a new runway would provide.

6. Regional Transportation

A. We respectfully request that Secretary Durand find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF based on the following grounds:

- Massport erroneously dismisses the direct connection between the effect of regional air transportation decentralization and the conditions that Massport cites in its effort to justify the construction of additional airside capacity;

- Massport misrepresents the service area for Logan Airport, in order to overestimate future demand and omits any analysis of the market share that regional airports service from areas assumed to be supported solely by Logan airport;

- Massport misrepresents and underestimates the potential diversion of future air transportation market share from Logan to regional airports;

- Massport fails to present any tangible evidence of serious, concerted support for continued regionalization and, in fact, shows evidence of infrastructure investment designed to enhance the dominance of Logan Airport in the regional transportation network; and

- Massport omits an analysis of the tangible regional economic benefits associated with decentralized air transportation services development, particularly in comparison to the highly concentrated benefits associated with the construction of the Preferred Alternative.

B. **Alternatively, we respectfully request that Secretary Durand and Administrator Garvey find the Supplemental DEIS/Final EIR inadequate and require Massport to file a Supplemental DEIS/Supplemental Final EIR with an expanded scope compelling Massport to:**

- Design, complete and approve a professional transportation demand study to evaluate business and consumer demand for regional air transportation services and alternative modes of transportation;
- Prepare and evaluate an accurate, trustworthy, updated and professional forecast of service area passenger allocation;
- Implement a truly independent, regionally neutral assessment of the Commonwealth's transportation requirements and support the implementation of an efficient and just regional air transportation network.

7. **Environmental Justice**

A. **We respectfully request that Secretary Durand find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF based on the following grounds:**

- The Supplemental DEIS/FEIR do not meet the requirements of the Executive Order and the DOT order, or the EOEA' own policy; 17.107
- Massport failed to include the most relevant information available to consider environmental impacts in specific areas, completely ignoring the 2000 census data in the filings;
- The Supplemental DEIS/Final EIR Fails to include comprehensive Public Health Information;
- Using Suffolk County as the sole reference community in the environmental justice analysis does not fully address the possible disproportionate high and adverse impacts of the project;
- Massport failed to properly review impacts of odors;
- The Supplemental DEIS/Final EIR did not provide for maximum public participation. While Secretary Durand clearly called for extensive public participation, Massport only held 1 public meeting on the Supplemental DEIS/FEIR in Boston for the public and at that hearing they limited comments to 3 minutes as opposed to the 5

minutes that were promised. The report should have been produced in its entirety in Spanish and Portuguese, but was not; and

- Massport's treatment and analysis of air quality impacts as a result of the Preferred Alternative is inadequate and will likely result in greater impacts.

B. Alternatively, we respectfully request that Secretary Durand and Administrator Garvey find the Supplemental DEIS/Final EIR inadequate and require Massport to file a Supplemental DEIS/Supplemental Final EIR with an expanded scope compelling Massport to:

- Fully comply with the requirements of the Executive Order, the DOT Order, and EOEA Policy;

- Redo its environmental justice analysis using the 2000 Census data;

- Complete a more comprehensive historical patterns of exposure to environmental hazards and multiple and cumulative exposure analysis; and

- Expand its comparison of communities (i.e. beyond Suffolk County) by comparing the communities that use the airport with communities that bear the burden of the airports impacts would help illuminate the relative benefits and burdens of the project and the corresponding environmental justice implications.

8. Economic Impacts

A. We respectfully request that Secretary Durand find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF based on the following grounds:

- Massport's discussion of economic benefits is misleading and unsubstantiated; 17.108

- Massport fails to identify or discuss negative economic impacts that may result due to the implementation of the Preferred Alternative;

- Massport fails to identify or analyze impacts on property values and municipal tax revenues;

- Massport fails to consider financial mitigation for impacted communities; and

- Massport ignores studies that document negative impact of airport operations on property values.

B. Alternatively, we respectfully request that Secretary Durand and Administrator Garvey find the Supplemental DEIS/Final EIR inadequate and require Massport to file a Supplemental DEIS/Supplemental Final EIR with an expanded scope compelling Massport to:

- Undertake a full and detailed analysis of the socio-economic impacts of the proposed Project, including in their analysis identification or discussion of negative economic impacts that may result due to the implementation of the Preferred Alternative; impacts on property values and municipal tax revenues; and consideration of financial mitigation for impacted communities.

9. Runway 14/32

A. **We respectfully request that Secretary Durand find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF based on the following grounds:**

- Massport misrepresents the fleet mix at Logan that will be primarily using the proposed 5,000 foot runway;
- Massport failed to analyze the minimum landing distances for the true and accurate fleet mix in varying whether conditions; and
- Massport failed to evaluate the reasons for the failure of the 5,000 foot runways in Philadelphia and Baltimore.
- Massport misrepresents, the degree to which Runway 14/32 will be used, overestimates its delay reduction benefits, and underestimates its negative environmental impacts.

B. Alternatively, we respectfully request that Secretary Durand and Administrator Garvey find the Supplemental DEIS/Final EIR inadequate and require Massport to file a Supplemental DEIS/Supplemental Final EIR with an expanded scope compelling Massport to:

- Redo its utilization, delay, and environmental analyses of the proposed 5000-foot runway based on a preliminary air space design, and the true

and accurate fleet mix, and the true and accurate minimum takeoff and landing requirements of the fleet mix under all weather and runway conditions;

- Examine and evaluate, in depth, the issues that prohibit the use of the current existing, substantially unused 5000 foot runways in Philadelphia and Baltimore.

10. Advanced Technology

A. We respectfully request that Secretary Durand find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF based on the following grounds:

- Massport has failed to adequately consider advanced navigational procedures for Runway 33L, which could mitigate the environmental impacts over the South Shore.

B. Alternatively, we respectfully request that Secretary Durand and Administrator Garvey find the Supplemental DEIS/Final EIR inadequate and require Massport to file a Supplemental DEIS/Supplemental Final EIR with an expanded scope compelling Massport to:

- Address the environmental benefits and delay-reduction benefits that can be achieved through the use of advanced navigational technology.

11. Section 61 Findings

A. We respectfully request that Secretary Durand find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF based on the following grounds:

- Massport has filed an inadequate SDEIS/FEIR and has failed to adequately address the MEPA substantive standard, since its analysis is based on erroneous assumptions, undisclosed material facts and false information.

B. Alternatively, we respectfully request that Secretary Durand and Administrator Garvey find the Supplemental DEIS/Final EIR inadequate and require Massport to file a Supplemental DEIS/Supplemental Final EIR with an expanded scope compelling Massport to:

- Propose detailed Section 61 Findings based on an adequate SDEIS/FEIR, which fully disclose all material facts and which do not include false information.

VIII. LOCAL IMPACTS

A. SOUTH SHORE (HINGHAM, COHASSET AND HULL)

1. Computer Predicted DNL Levels for Hull are Systematically Biased Low.

The 1999 Supplemental DEIS/Final EIR prediction underestimates the true noise in Hull by 7 dB.

In Appendix E (Volume 3) of the Supplemental DEIS/Final EIR, Table 6.2-11, entitled "Calculated Day-Night Sound Level Values in dB from Flight Operations for the 1999 – 29 Million Passenger Low Fleet", lists the Alternative 4 (No Action) 1999 prediction at the Hull monitor as 54.8 dB. Figure 6.2-9 (page 6-33) shows the 1999 – 29M Low value at Hull to be no more than 54.8 dB. In comparison, the 1999 ESPR (Table 6-6 on page 6-30) lists INM predicted DNL at the Hull monitor as 58.3 dB and Figure 6-3 on page 6-17 of the 1999 ESPR shows the value as about 58 or 59 dB. That is, the 1999 Supplemental DEIS/Final EIR prediction for 1999 is 3.5 dB less than the actual 1999 ESPR value for 1999 at the Hull monitor. Moreover, the 1999 ESPR are based on 27.5M operations while the 1999 Supplemental DEIS/Final EIR are based on 29M operations. This difference amounts to an additional error of over 0.2 dB. 17.109

Further, the companion report entitled "Current Noise Levels Generated at Hull by Logan Airport"[68] shows that the actual measured airport only noise levels in 1999 at Hull were 61.2 dB. Therefore, including the 0.2 dB for the difference between using 27.5M and 29M as the number of operations, the 1999 Supplemental DEIS/Final EIR prediction under-predicts the true measured DNL at the Hull monitor by just under 7 dB. Note: an increase of 7 dB is equivalent to a fivefold increase in the number of aircraft operations.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; and

[68] *Current Noise Levels Generated at Hull by Logan Airport,* Paul Schomer (May 31,2001); See Appendix H.

compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

2. <u>The 1993 SDEIS/FEIR "historical" prediction underestimates the true noise in Hull by 9 dB.</u> 17.110

Figure 5.2-3 on page 5-21 of the Supplemental DEIS/Final EIR Massport presents the predicted 1993 Historic DNL contours. The DNL at the Hull monitor is approximately 55 dB. The companion report entitled "Current Noise Levels Generated at Hull by Logan Airport"[69] shows that the actual measured airport only noise levels in 1993 were 63.7 dB. That is, the 1993 Historical Supplemental DEIS/Final EIR prediction under-predicts the true, measured DNL at the Hull monitor by just under 9 dB. Note: an increase of 9 dB is equivalent to an eightfold increase in the number of aircraft operations.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

3. <u>Compared with other sites, the Supplemental DEIS/Final EIR DNL predictions for the Hull monitor are biased low.</u> 17.111

The Carey Circle monitor site in Revere is similar to Hull. Both sites are near water and have similar predictions based on the 1999 ESPR (Table 6-6 on page 6-30). In the 1999 ESPR, the INM predictions at Hull and at Carey Circle are 58.3 and 58.9 dB, respectively. In Appendix E (Volume 3) of the Supplemental DEIS/Final EIR, Table 6.2-11, entitled "Calculated Day-Night Sound Level Values in dB from Flight Operations for the 1999 – 29 Million Passenger Low Fleet", lists the Alternative 4 (No Action) 1999 prediction at the Hull monitor as 54.8 dB and at Carey Circle as 59.0 dB. That is, the 1999 predictions for the Supplemental DEIS/Final EIR and the 1999 ESPR are the same for Carey Circle

[69] Id.

but differ by 4 dB at Hull. Note: an increase of 4 dB is equivalent to a two and one-half fold increase in the number of aircraft operations.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

4. <u>The 37.5 M High RJ Fleet DNL predictions are biased low by about 8 dB.</u>

The 1999 Supplemental DEIS/Final EIR predictions at the Hull monitor are biased low compared with cohort predictions at a like site (i.e. Carey Circle). Compared with actual, on-site measurements at Hull (the "gold" standard), the 1999 Supplemental DEIS/Final EIR prediction is low by about 7 dB and the historical 1993 Supplemental DEIS/Final EIR prediction is low by about 9 dB. Therefore, since the same basic assumptions and flight tracks are used for the 37.5 M High RJ fleet predictions in the Supplemental DEIS/Final EIR, one must expect that the 37.5M High RJ fleet DNL prediction is biased low by about 8 dB at Hull. Note: an increase of 8 dB is equivalent to over a six-fold increase in the number of aircraft operations.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

5. <u>The 37.5 M High RJ Fleet DNL at Hull may be 73 dB.</u>

For the High RJ fleet, Table 6.2-24 on page 6-74 gives the predicted DNL at the Hull monitor as 55.7 dB for the 37.5M High RJ Fleet whereas Figure 6.2-11 on 17.112

page 6-59 gives this value as about 60 dB, a discrepancy of 4 to 5 dB. This same value of 55.7 dB at the Hull monitor for the 37.5M High RJ fleet is replicated in Table E.1[70] of Volume 3 of the Supplemental DEIS/Final EIR. And Table E.2[71] of Volume 3 of the Supplemental DEIS/Final EIR gives the nighttime equivalent level at the Hull monitor as 58.3 dB. However, this nighttime equivalent level using standard equations, calculates to a DNL that is at least 64 dB before adding in the daytime noise. With daytime noise, the DNL at the Hull monitor according to this table for the 37.5M High RJ fleet is 65 dB, a discrepancy of almost 10 dB between Table E.1 or Table 6.2-24 and Table E.2. Note: an increase of 10 dB is equivalent to almost a tenfold increase in the number of aircraft operations.

Based on the nighttime equivalent level data of Table E.2 in Volume 3, and the 8 dB error in prediction inherent in the Supplemental DEIS/Final EIR at Hull, the true value for 37.5M High RJ fleet DNL prediction may be as large as 73 dB. Based on the contours of Figure 6.2-11 that show a DNL value of 60 dB at the Hull monitor, the true value 37.5M High RJ fleet DNL prediction is 68 dB.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

6. The assumptions in the SDEIS/FEIR regarding the aircraft fleet are inappropriate.

The Supplemental DEIS/Final EIR appears to assume that all or nearly all of the large jet aircraft fleet will be true, Stage-3, quiet aircraft. None or nearly none of the large jet aircraft are assumed to be Stage 2. This assumption is contrary to the expressed position of the United States Government from the President on down. The United States Government has consistently championed the right of U.S. carriers to fly retrofit Stage-2 aircraft for as long as they want to the great consternation of the European Community. Although airport operators, including

[70] Table E.1 INM-Computed Day-Night Sound Levels at Specific Points for 1998 and for All Study Alternatives—2015 High Regional Jet Fleet.
[71] Table E.2 INM-Computed Nighttime Equivalent Sound Levels at Specific Points for 1998 and for All Study Alternatives—2015 High Regional Jet Fleet.

Logan, have expressed the desire to see the removal of retrofit Stage 2 aircraft from the fleet, there is no movement on the part of the United States Government or the Air Traffic Association in this direction. Therefore, Massport has no basis for assuming the elimination of retrofit Stage 2 aircraft from the fleet.

The SDEIS/FEIR in the High RJ scenario assumes that the increase in RJ operations will coincide with a decrease in large jet operations. While it may be true that the RJs are used to replace some DC-9s, B727s, or MD80s as well as replacing small prop aircraft, it is inconceivable that a EMB 145 (50 passenger commuter jet) will replace a B747 on a flight from Boston to London. However, in the Supplemental DEIS/Final EIR the High RJ Fleet shows a reduction of heavy jets like the B747 with a commensurate increase in RJ operations. Naturally, a RJ operation produces much less noise than does the B747 that it replaces. Specifically, B-747 go from 20.5 operations per day under the 37.5M High fleet to 2.2 operations per day under the 37.5M High RJ fleet; MD11 go from 17.9 operations per day to 4.2 operations per day; and the sum of 747, 757, 767, 777 and MD11 go from 269 operations per day under the 37.5M High fleet to 169 operations per day under the 37.5M High RJ fleet. Only the 767 and 777 show small increases; everything else decreases precipitously.

The Secretary should find that Massport knowingly presented false information and manipulated data, and therefore should require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to update its analysis on the fleet mix at Logan using true and accurate data; and based on the updated data, compel Massport to redo all of its noise data.

7. The INM computer simulations are inherently biased low. This inherent bias adds biases the levels at Hull low by an additional 3 dB.

17.113

The companion report, "Current Airport Noise Levels at Hull", shows that true measured DNL levels are about 3 dB greater than accurately and correctly constructed DNL predictions. That is, at Hull, there is an inherent bias to the INM that is independent of the input data or user assumptions. At least one decibel of bias error in predictions using INM occurs at Hull because of the "sound propagation over water" situation. Massport, to its credit, corrects for sound propagation over water, but only when the aircraft are below 1000 ft AGL. By Hull the aircraft are above 1000 ft but the water surface is still a factor in enhancing the sound propagation. Two other decibels of bias error can be attributed to known errors in the INM sideline predictions of noise that result from engine installation effects and other propagation effects.[72]

[72] Because of these known biases, the current INM sound propagation algorithms are currently under revision by the Society of Automotive Engineers A-21 Aircraft Noise Committee.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning to include sound propagation over water, over 1000 feet AGL.

8. The number of nighttime operations by Hull are biased low. 17.114

Currently, in 1999 by Hull, 27.5 percent of landings on 33L are at night. Under the 37.5M High RJ fleet, this percentage drops almost in half to just 15.5 percent. The assumed percentage of nighttime operations on Proposed Runway 32 is only 8.8 percent; and this prediction is for a much more crowded and delayed airport. (Runways 32 and 33L are the "preferred" runways for nighttime landings). In contrast at Carey Circle, an area that is "not preferred" for nighttime operations, the percentage of nighttime landings goes from a current (i.e.1999) percentage of 31.3 to 45.5 percent under the 37.5M High RJ fleet alternative. These types of faulty assumptions bias the data low by Hull.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

9. Reasons for the Systematically Low-Biased Predictions at Hull.

Assumed flight tracks by Hull are contrary to fact and contrary to other published Massport data. The departure flight tracks supposedly used for the Supplemental DEIS/Final EIR are depicted in Figure 5.2-1 on page 5-15 of said document. The 1999 ESPR published by Massport for Boston Logan International Airport (Logan) shows takeoff flight tracks for Runways 22L and 22R.[73] Some of these flight tracks go directly over the main part of the Hull peninsula. Similarly, RADAR plots provided by the Logan noise office at public meetings show takeoffs directly over the main part of the Hull peninsula. But the Supplemental DEIS/Final EIR (Figure 5.2-1, page 5-15) fails to show any departure flight tracks

[73] 1999 ESPR for Logan , page F-5, Figure F-1—Jet Departure Flight Tracks.

over the main part of the Hull peninsula. Rather, the Supplemental DEIS/Final EIR only shows flights over water. This omission of takeoff flights over the main part of the Hull peninsula is contrary to published Massport data and Massport RADAR plots, and it is contrary to fact. This omission biases the resulting contours to be low at Hull.

The 1999 ESPR published by Massport for Boston Logan International Airport (Logan) shows landing flight tracks for Runways 33L.[74] The jet aircraft flight track goes directly over Hull in a perfect line with the extended Runway 33L centerline. Moreover, RADAR plots provided by the Logan noise office at public meetings generally show landings along a straight line that is an extension of Runway 33L centerline, a line that goes directly over Hull. However, the Supplemental DEIS/Final EIR (Figure 5.2-2, page 5-17) fails to show any arrival flight track in a straight line over Hull. Rather, the Supplemental DEIS/Final EIR creates a large set of "assumed" landing flight tracks that mainly go west of Hull over water. The substitution of a large set of landing flight tracts that avoid Hull in place of a single flight track over Hull is contrary to published Massport data and Massport RADAR plots, and it is contrary to fact. This substitution biases the resulting contours to be low at Hull.

The Supplemental DEIS/Final EIR noise contours are inconsistent with the Supplemental DEIS/Final EIR flight tracks by Hull. Figure 5.2-2 (page 5-17) of the Supplemental DEIS/Final EIR shows "Modeled Arrival Flight Tracks." Flight tracks for arrivals to Runway 33L are in line with the extended Runway 33L centerline from about 4 miles from the runway up to the threshold of the Runway. Figure F-2 on page F-7 of the 1999 ESPR published by Massport shows a single arrival flight track to Runway 33L that is precisely the extended Runway 33L centerline. Both the Supplemental DEIS/Final EIR and the 1999 ESPR note that differences between the 1999 ESPR and the 1998 Annual Update are small. The Supplemental DEIS/Final EIR states:

> "While the 1999 Environmental Status and Planning Report published in December 2000 includes updated analyses for 1999, the differences between the two study years are small. Between 1998 and 1999, operations declined by 2.5 percent, primarily due to a decline in regional carrier operations. Since the fleet mix and runway use varied little, the shape of the noise contours and the population impacts were also similar..."

[74] 1999 ESPR for Logan , page F-7, Figure F-2—Jet Arrival Flight Tracks.

Figure 6.2-9 on page 6-33 of the Supplemental DEIS/Final EIR compares the 1999 ESPR contours with the 1999-29M Low no-build prediction of the Supplemental DEIS/Final EIR. Also, Figure 6-3 of the 1999 ESPR shows the 1999 DNL noise contours for Logan. In both the 1998 Annual Update contours and in the 1999 ESPR contours, the "tips" of the noise contours going towards Hull follow the landing flight track to Runway 33L over Hull, the extended centerline of Runway 33L. However, the "tips" of the 1999-29M Low no-build prediction of the Supplemental DEIS/Final EIR (Figure 6.2-9 on page 6-33) drop about 5 degrees south of the landing flight track to Runway 33L over Hull, the extended centerline of Runway 33L. This is not an accidental discrepancy in just this figure, a similar discrepancy is evident in Figure 5.2-3 on page 5-21 of the Supplemental DEIS/Final EIR. This discrepancy simply is not possible. The only simple explanation for this discrepancy is that the contours in the SDEIS/FEIR were made with flight tracks other than those shown in the SDEIS/FEIR or the contour generation otherwise deviates from the data given in the Supplemental DEIS/Final EIR. This unexplained shift in the contours to the south by Hull moves the apparent aircraft noise away from Hull and over the water. This shift biases the resulting contours to be low at Hull.

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; and compelling Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public a reasonable opportunity to present thoughtful comments. The data must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

10. Data presented by Massport in various tables and figures are inconsistent throughout the Supplemental DEIS/Final EIR.

Table 6.2-11 versus Figure 6.2-8

Table 6.2-11 on page 6-46 gives the predicted DNL at the Hull monitor as 55.6 dB for the 37.5M High fleet whereas Figure 6.2-8 on page 6-29 gives this value as about 59 dB – a discrepancy of 3 to 4 dB. Note: an increase of 3 dB is equivalent to a doubling of the number of aircraft operations.

Table 6.2-24 versus Figure 6.21 versus Table E.2

For the High RJ fleet, Table 6.2-24 on page 6-74 gives the predicted DNL at the Hull monitor as 55.7 dB for the 37.5M High RJ fleet where as Figure 6.2-11 on page 6-59 gives this value as about 60 dB – a discrepancy of 4 to 5 dB. This same value of 55.7 dB at the Hull monitor for the 37.5M High RJ fleet is replicated in Table E.1[75] of Volume 3 (no consistent page numbers) of the SDEIS/FEIR. And Table E.2[76] of Volume 3 (no consistent page numbers) of the SDEIS/FEIR gives the nighttime equivalent level at the Hull monitor as 58.3 dB. But this nighttime equivalent level using standard equations, calculates to a DNL that is at least 64 dB before adding in the daytime noise. With daytime noise, the DNL at the Hull monitor according to this table for the 37.5M High RJ fleet is 65 dB – a discrepancy of almost 10 dB between Table E.1 or Table 6.2-24 and Table E.2. Note: an increase of 10 dB is equivalent to a tenfold increase in the number of aircraft operations.

In summary, there are three different values for the 37.5M High RJ fleet DNL prediction at Hull in the SDEIS/FEIR, two in tables and one in a figure. All should be the same. All are different. The difference from the smallest to the largest is almost 10 dB. Similar discrepancies are present for the 37.5M High fleet. It is simply impossible to make any sense of a report that has such glaring discrepancies for critical information like the predicted noise levels.

Table 6.2-1 versus Appendix E "Excerpt from the Airside Draft EIS/EIR"

Table 6.2-1 on page 6-9 is titled: "Average Daily Operations for 1998 and for Future 29M Low and 37.5M High Fleet Scenarios for the No Action Alternative and the Preferred Alternative." There are two lines for the 29M Low section of this table and two lines for the 37.5M High section of this table; in each case, one line is for the No Action Alternative and one line is for the Preferred Alternative. Supposedly, these are the fundamental predictions of numbers of aircraft for the entire EIS.

Appendix E, page 1 contains an "Excerpt from the Airside Draft EIS/EIR". The top table on this page is labeled: "1999 and 2010 Logan Average Daily Operations – Without Peak Period Pricing (Alternative 1A and 4). Line entries in this table include one line noted as "1999 – 29M Low" and one line noted as "2010 – 37.5M High".

From the titles it would seem that these two tables should have the same data. They do not. First, Table 6.2-1 indicates that the numbers of operations differ

[75] Table E.1 INM-Computed Day-Night Sound Levels at Specific Points for 1998 and for All Study Alternatives – 2015 High Regional Jet Fleet.
[76] Table E.2 INM-Computed Nighttime Equivalent Sound Levels at Specific Points for 1998 and for All Study Alternatives – 2015 High Regional Jet Fleet.

between Alternative 4 and Alternative 1A – there are two lines so labeled for each fleet alternative. But the table in Appendix E indicates that the numbers of operations are the same for Alternative 4 and Alternative 1A. This discrepancy exists for both the 29M Low case and for the 37.5M High case. Second, the numbers of operations listed in the table on Page 1 of Appendix E for the 29M Low case do not agree with either of the lines in Table 6.2-1 for the 29M Low case. Third, the numbers of operations listed in the table on Page 1 of Appendix E for the 37.5M High case do not agree with either of the lines in Table 6.2-1 for the 37.5M High case.

The numbers of operations are fundamental to the INM predictions but are ambiguous in the Supplemental DEIS/Final EIR.

11. <u>Massport should redo its contours to ensure that all eligible dwellings are sound-proofed.</u>

Massport committed to soundproofing for those who reside in the 65 dB level, therefore Massport must reanalyze the data regarding Hull using actual data so that it can insure to include the 1500-2000 homes in Hull (including Hull High School) and Hingham that are expected to be affected by the increased noise. At an average cost of Thirty Thousand ($30,000.00) Dollars per home, the cost of sound proofing homes in Hull and Hingham could add an additional Sixty Million ($60,000,000.00) Dollars to the cost of building Proposed Runway 14/32. If the cost of sound proofing in Hull and Hingham is indicative of the actual expansion of the 65 dB contour in other areas, it is possible that total soundproofing costs could significantly exceed the total estimated Project costs. 17.115

The Secretary should find that Massport knowingly omitted material facts, and therefore require Massport to file a new ENF. Alternatively, the Secretary should find the Final EIR inadequate and require Massport to file a Supplemental Final EIR with an expanded scope compelling Massport to redo all of its noise data from the beginning; compelling Massport to use true and correct data; compelling Massport to redo its tables and contours so that they are consistent with the information presented; and compel Massport to present the data in a comprehensive, clear and easy to understand format that would permit the public to review and understand the material, and to provide the public reasonable opportunity to present thoughtful comments. The data presented must be provided in sufficient detail so that others can replicate Massport's INM Modeling results and test the underlying assumptions.

B. SOMERVILLE

A. Critical tabular data for Somerville are missing from the SDEIS/FEIR:

Table 5.2-5 on page 5-29 shows the full set of noise monitors operated by Logan Airport: But other tables like Table 6.2-11 on page 6-26 of the SDEIS/FEIR omit the following sites:

Monitor 18	Nahant
Monitor 19	Swampscott
Monitor 20	Lynn
Monitor 21	Everett and Somerville
Monitor 22	Medford
Monitor 27	Roxbury
Monitor 29	Mattapan
Monitor 30	East Boston

No explanation is given for the omission of data for these sites from all of the other tables in the SDEIS/FEIR, but it certainly makes the document incomplete for the following towns and communities: Nahant, Roxbury, Dorchester, Swampscott, Lynn, Everett, Medford, Somerville, Dorchester, and Mattapan.

The companion report dealing with the noise monitors that are situated Northwest of Logan Airport and near to the extended centerline of departure Runway 33L[1] draws the following relevant conclusions:

1. The noise monitors at East Boston, Everett, and Medford primarily are measuring airport noise. This is evidenced by the systematic decrease in levels with distance from the airport, the year to year correlation of the levels with one another, the correlation with numbers of commercial jet takeoffs on Runway 33L, and the correlation with complaints. In contrast, the monitor at Chelsea is measuring levels that are too high and appear to be greatly influenced by local, non-airport noise sources.

   Analysis of the noise monitor data from Hull[2], another monitor that primarily measures airport noise, suggests that the true levels of airport noise are within 2 dB of the levels registered by the noise monitors.

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[1] Paul Schomer, "Analysis of Airport Noise by Somerville and other areas Northwest of Logan Airport," June 2, 2001; See Appendix P.

[2] A companion report entitled: Analysis of Airport Noise Monitoring at Hull, MA, May 31, 2001, See Appendix C.

2. Complaints from Somerville and Everett correlate positively with the yearly DNL measured by the Everett noise monitor.

3. The yearly DNL measured by the Everett noise monitor grows substantially with the number of commercial jet aircraft takeoffs on Runway 33L. This result is just as predicted by the DNL metric formulation.

4. Complaints from Somerville and Everett correlate positively with the number of commercial jet aircraft takeoffs on Runway 33L. If the number of takeoffs triples, then this result suggests that the number of complaints will triple.

These noise monitor results represent the "gold standard" for delineating what the existing airport noise is and how the airport noise changes with changes in operations at Logan airport. **These monitor data should have been used in the SDEIS/FEIR to establish the present baseline and to calibrate the INM model to unique local conditions. Instead, the SDEIS/FEIR totally ignores the existence of noise monitors near to Somerville and substitutes totally unvalidated hypothetical noise contours.**

B. Systematic large biases by Somerville in the INM predictions are ignored in the SDEIS/FEIR:

On page 5-28 of the SDEIS/FEIR, the average difference between the "aircraft only" DNLs and the INM-generated values is given as 0.9 dB. This statement is used to justify the sole use of INM predicted results. There are three problems with this statement. First, it is NOT true. The actual difference is 1.5 dB; not the 0.9 quoted in the text. Second, there are systematic biases to the differences.

> When the "airport only" levels are between 68 and 78 dB, then the average difference is 0.2 dB
>
> When the "airport only" levels are between 58 and 68 dB, then the average difference is 1.0 dB
>
> When the "airport only" levels are between 48 and 58 dB, then the average difference is 3.1 dB

That is, for the lower DNLs such as by Somerville, the INM is systematically under-predicting by 3.1 dB.

Third, there may be systematic biases to the determination of the "airport only" levels. A companion study "Assessment of Airport Noise Monitoring at Hull" shows that at Hull, the "airport only" levels are 2 dB too low. A second companion study "Analysis of Airport Noise by Somerville and other Areas Northwest of Logan Airport" shows that the monitors by Medford, Everett and East Boston are primarily measuring airport noise. **Massport should have used**

these measured data, properly adjusted for "airport only" conditions, to adjust the INM computer simulations and the assumptions thereto, to properly and consistently reflect reality by Somerville and other areas northwest of the airport.

C. A whole operational scenario that is critical to Somerville has been deleted from the SDEIS/FEIR

The DEIS contained a runway configuration with simultaneous landings on Runways 32 and 27 and with takeoffs on Runway 33L. This appears to be a very efficient set of runways since the smaller and larger aircraft can be well separated on landings. Also, very many of the aircraft taking off on 33L can do so after the intersection of Runways 33L and 27 so that there is no conflict. This runway configuration no longer appears in the SDEIS/FEIR.

Professor Odini, in his address to the Garvey Panel, said that the landings over the south shore and takeoffs to the northwest may have been under-predicted in the DEIS. Massport has responded to Odini by taking out all mention of the very operations he said were under-predicted—the runway configuration described above. But this runway configuration would increase noise to the northwest to towns receiving noise from takeoffs on 33L such as Chelsea and Somerville. **The SDEIS/FEIR fails to discuss a runway configuration that becomes possible with the proposed new Runway 14/32. This configuration will further increase takeoffs in the vicinity of Somerville thereby exacerbating the airport noise problem in Somerville.**

D. The noise contours do not go low enough in level to adequately describe the true impacts by Somerville

The SDEIS/FEIR predicts DNL noise contours as low as 60 dB but they term the 65 dB DNL contour as "the threshold of noise incompatibility with residential land uses."[3] **The use of a DNL criterion of 65 dB is simply outmoded and unacceptable.** As the companion study concludes:[4]

> "1. Nearly all agencies and boards, standards setting bodies, and international organizations that have cognizance over noise producing sources use a DNL criterion value of 55 dB as the threshold for defining noise impact in urban residential areas. In fact, of this large number of agencies, boards, standards setting bodies, and international organizations, only the Department of Defense and the Federal Aviation Administration suggest a criterion value for DNL that is higher than 55 dB.
>
> "2. The policies of FAA/DOD (and HUD) all were developed in the early 1970's and earlier (e.g., HUD, 1971). In contrast, most of the agencies and

[3] SDEIS/FEIR, page 5-20

[4] A White Paper: Assessment of Noise Annoyance, May 2001.

boards, standard setting bodies, and international organizations have established their policies after 1995. In particular, the World Health Organization recommendations (WHO, 1999) are based on over 25 years more worldwide research into noise effects than are the earlier FAA/DOD policies.

"3. Significant evidence exists to suggest that aircraft noise is more annoying than is road traffic noise for the same DNL level.

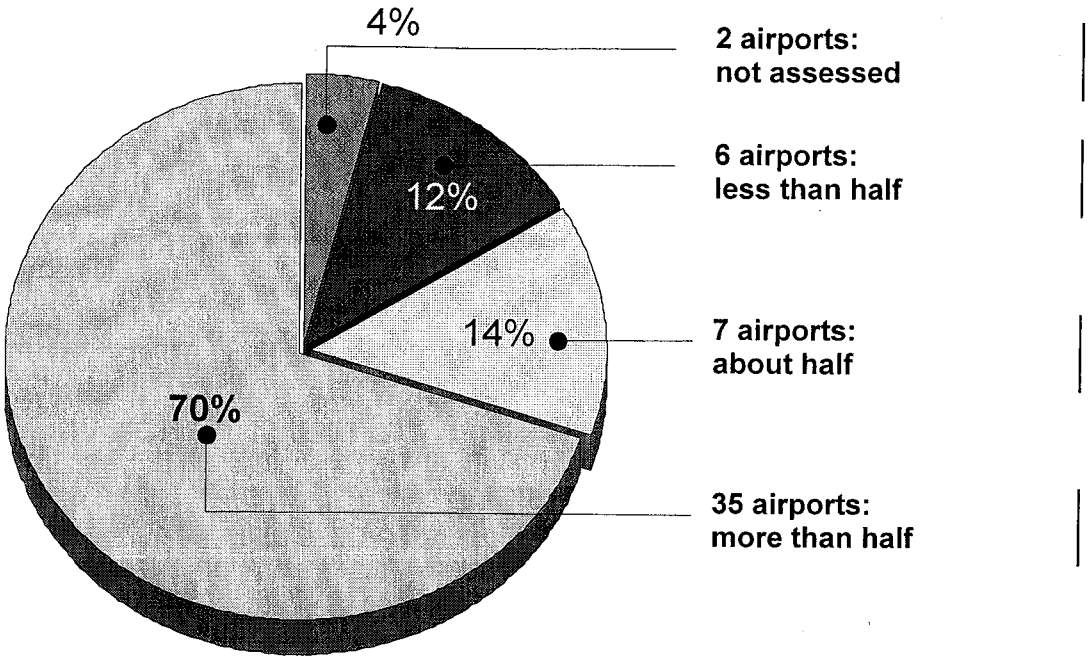
"4. Of all of the boards and agencies, standards setting bodies, and internationals organizations, one should consider the World Health Organization and the National Research Council as the primary authorities on acceptable levels of pollutants. They are charged with developing this type of scientific position and have clearly spoken. WHO terms DNL 55 dB as engendering serious annoyance and creating an unhealthy environment and WHO terms DNL 50 dB as engendering moderate annoyance. The NRC goes further, and, in many instances, recommends assessments when the project noise exceeds a DNL 40 dB.

"5. No single DNL criterion is equally applicable to all residential situations and all types of residential communities. A sizeable number of agencies and boards, standards setting bodies, and international organizations that have cognizance over noise producing sources recommend a DNL criterion value that is less than 55 dB as the threshold for defining noise impact in sparse suburban and rural residential areas. Rural areas require a criterion that is 10 dB lower than the criterion used in normal urban areas.

"6. For residential areas and other similarly noise sensitive land uses, noise impact becomes significant in urban areas when the DNL exceeds 55 dB. In suburban areas where the population density is between 1250 and 5000 inhabitants per square mile, noise impact becomes significant when the DNL exceeds 50 dB. And in rural areas where the population density is less than 1250 inhabitants per square mile, noise impact becomes significant when the DNL exceeds 45 dB."

Evidence for the inadequacy of the 65 DNL criterion can be found in the recent GAO study.[5] Figure 25 from this study (below) shows the portions of airports' noise complaints that come from areas outside the 65-dB DNL contour.

[5] GAO, Aviation and the Environment: Results From a Survey of the Nation's 50 Busiest Commercial Service Airports," GAO/RCED-00-222, August 2000.



Portion of Airports' Noise Complaints That Come From Areas Outside the 65-dB DNL Contour

E. The 37.5 M High RJ Fleet Scenario does not reflect reality by Somerville 17.116

Table 3 in C.6 of the SDEIS/FEIR gives total annual jet operations excluding RJs by runway end. Takeoff operations on Runway 33L increase from about 8000 in 1999 (Table 2) to almost 20,000 (Table 3), an increase of 250 percent. Table 4 gives equivalent jet operations by runway end. In Table 4, takeoffs on Runway 33L increase from 17,200 in 1999 to 68,200 in the 37.5 M High RJ fleet scenario—an increase of almost 400 percent. But by Somerville and Everett, the contours under the 37.5 M High RJ fleet scenario (Alternative 1A) grow **smaller** compared with the contours for the 29 M Alternative 4 fleet scenario. This simply cannot be. With reasonable and proper assumptions, the contours do not get smaller with a fourfold increase in effective operations.

One faulty assumption in the SDEIS/FEIR is that the SDEIS/FEIR appears to assume that all or nearly all of the large jet aircraft fleet will be true, Stage-3, quiet aircraft. None, or nearly none of the large jet aircraft are assumed to be Stage 2. This assumption is contrary to the expressed position of the US Government from the President on down. The US Government has consistently championed the right of US Carriers to fly retrofit Stage-2 aircraft for as long as they want to the great consternation of the European Community. Although airport operators, including Logan, have expressed the desire to see the removal of retrofit Stage-2 aircraft from the fleet, there is no movement on the part of the

US Government or the Air Traffic Association in this direction. Thus, there is no basis for assuming the elimination of retrofit Stage 2 aircraft from the fleet..

The SDEIS/FEIR in the High RJ scenario assumes that the increase in RJ operations will coincide with a decrease in large jet operations. While it may be true that the RJs are used to replace some DC-9s, B727s, or MD80s as well as replacing small prop aircraft, it is inconceivable that a EMB 145 (50 passenger commuter jet) will replace a B747 on a flight from Boston to London. But the High RJ Fleet shows a reduction of heavy jets like the B747 with a commensurate increase in RJ operations. Naturally, an RJ operation produces much less noise than does the B747 that it replaces. Specifically, B-747 go from 20.5 per day under the 37.5 M High fleet to 2.2 per day under the 37.5 M High RJ fleet, MD11 go from 17.9 per day to 4.2 per day, and the sum of 747, 757, 767, 777 and MD11 go from 269 per day under the 37.5 M High fleet to 169.6 per day under the 37.5 M High RJ fleet. Only the 767 and 777 show small increases; everything else decreases precipitously.

If reasonable and proper assumptions had been made in the SDEIS/FEIR then the 37.5 M High RJ fleet scenario contours by Somerville might have reflected reality.

F. The SDEIS/FEIR fails to evaluate known impacts by Somerville that will lead to increased complaints 17.117

The SDEIS/FEIR does not consider sleep disruption as an impact. But many of the Somerville residents have complained that noise early in the morning wakes them—frequently at times like 6 AM. But under the 37.5 M High RJ fleet scenario, early morning takeoffs on Runway 33L, will increase. There will be an increase in sleep disruption and, as the companion study shows[6], likely a three to fourfold increase in complaints. **The SDEIS/FEIR should have considered sleep disruption and complaints in its analysis.**

G. The SDEIS/FEIR fails to evaluate the unique local topography at Sumerville 17.118

Somerville includes seven hills. Three of these hills have steep slopes facing the aircraft flight tracks. Housing and other structures atop these hills receive greater noise than is predicted by the INM model because the ground drops away so quickly that it precludes the normal ground absorption of sound that is inherently assumed within the INM methodology. Two of the hills have tall structures on them—an apartment complex on one hill and a hospital on the other. The height of these structures adds further to their received sound levels because there is nothing by them to block or absorb the sound. These structures receive significantly more noise than is predicted by the INM computer model. **The**

[6] Paul Schomer, "Analysis of airport noise by Somerville and other areas northwest of Logan Airport," June 2, 2001.

SDEIS/FEIR should consider unique the unique local topography at Somerville—especially when the noise receptor is a noise sensitive hospital.

H. In summary for Somerville:

1. Critical Logan noise monitor data by Somerville are totally absent from the DEIS/FEIR.

2. Logan noise monitor data are not used to calibrate and adjust the DEIS/FEIR predictions to reality.

3. Known biases in the INM are ignored in the DEIS/FEIR.

4. The DEIS/FEIR makes faulty biased assumptions regarding the fleet mix used to develop the INM predictions.

5. The FDEIS/FEIR truncates its impact assessment (DNL) at an arbitrarily high DNL level. Other known impacts such as sleep disruption and complaints are ignored.

6. The SDEIS/FEIR expunges a whole operational scenario based on the proposed new Runway 14/32, a scenario that will greatly impact the residents of Somerville.

7. The SDEIS/FEIR fails to consider the full range of expected noise impacts.

8. The SDEIS/FEIR fails to consider unique local topography by Somerville, topography that in one case increases the received noise at a noise sensitive hospital site.

CITY OF SOMERVILLE, MASSACHUSETTS
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May 31, 2001

Secretary of Environmental Affairs
Attention: MEPA Office
Mr. Arthur Pugsley
251 Causeway Street
Boston, MA 02114

Mr. John C. Silva
Manager, Environmental Programs
Airports Division, ANE-600
New England Region
12 New England Executive Park
Burlington, MA 01803

Re: Proposed Logan Airside Improvements Planning Project
Final EIR (EOEA No. 10458)
Supplemental Draft EIS

Dear Mr. Pugsley and Mr. Silva:

The enclosed documents serve as comments submitted on behalf of the City of Somerville regarding the above referenced project. Please find copies of the following:

- A copy of my testimony presented during the joint federal/state public hearing on April 25, 2001.
- Comments from Christine Wrigley, Director of Transportation and Commercial Development, and City of Somerville representative to the Community Advisory Committee (CAC).
- Comments from Paul Schomer, Schomer and Associates, Consultants in Acoustics and Noise Control.

The City of Somerville has stated its opposition to this project throughout this process. However, the following comments specifically pertain to the SDEIS/FEIR and the inadequacies that we have found within the document. For the reasons discussed in the attached documents, the City of Somerville urges MEPA and the FAA to find the SDEIS/FEIR insufficient.

Thank you for the opportunity to submit comments and for your consideration of the matters discussed in the enclosed documents.

Sincerely,

Dorothy A. Kelly Gay

Dorothy A. Kelly Gay,
Mayor

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April 25, 2001 Federal/State Public Hearing
Logan Airside Improvements Planning Program

Final EIR
Secretary of Environmental Affairs
Attention MEPA Office
Mr. Arthur Pugsley – EOEA No. 10458
251 Causeway Street
Boston, MA 02114

Supplemental Draft EIS
John C. Silva
Manager, Environmental Programs
Airports Division, ANE-600
New England Region
12 New England Executive Park
Burlington, MA 01803

I am here today to state the City of Somerville's opposition to Massport's "Preferred Alternative" described in the joint Supplemental Draft EIS/Final EIR. As a proponent of open government and public participation, I object to the lack of consideration that Massport and the FAA has exhibited towards the public input that has been provided throughout this process.

Appendix C of the document indicates that the number of jet departures from Runway 33 will increase from the 1999 level of 8,300 departures per year to 30,500 departures by the year 2015 as a result of the Preferred Alternative (I would also like to note that the actual number of flights is not stated in the main document – percentages are used which is misleading in assessing the true impacts). This will result in a 272% increase in flights over Somerville and other communities northwest of the airport. Therefore, the Preferred Alternative will have a negative impact on the quality of life in our community due to the projected increase in the number of flights that will take off and land over the City of Somerville.

Approximately 40 letters from Somerville residents were submitted to the Massachusetts Office of Environmental Affairs in response to the EIS submitted in 1999. These letters overwhelming document the concerns that Somerville residents have regarding both the existing level of noise caused by overflights and the projected increase in flights and associated noise that would be generated as a result of the Preferred Alternative. However, these concerns were not given adequate consideration in the preparation of the most recent EIS/EIR. In fact, Massport's response to these concerns in Volume 9 of the document states "The Day-Night Sound Level values in Somerville are less than 60 dB for the future scenarios." Utilizing this statement as a response to noise concerns essentially states that the concerns of Somerville residents are

unfounded because they are outside of the FAA/Massport "impacted area" defined by computer models and unconfirmed by actual experience. Yet, telephone calls to Massport's Noise Abatement Office by residents and the City's participation in Massport's Community Advisory Committee (CAC) is an indication that Somerville is impacted by noise generated by Logan in spite of Massport's determination that the sound level does not constitute "highly annoyed."

Additional comments to Somerville noise concerns by Massport is that "the Preferred Alternative would promote runway use in a manner that is more consistent with annual PRAS goals" and "the unidirectional Runway 14/32 would allow the controllers to approach but still remain below the annual goals for these operations. The Preferential Runway Advisory System (PRAS) goals were established based on a thorough public participation process in response to community noise concerns." Consistency with PRAS goals is not an adequate response to the noise concerns of Somerville residents for the following reasons:

1. The PRAS goals are outdated, having been developed almost 20 years ago.
2. Somerville was not one of the participating communities in development of the PRAS, nor were half of the communities now represented by the CAC.
3. The May 7,1999 Certificate signed by MEPA Secretary Robert Durand specifically stated, "the Final EIR should discuss whether any updates of the PRAS goals are contemplated." Massport's response to this request is that "there have been no significant demographic changes to warrant an update of the PRAS goals." There does not appear to be any acknowledgement within the document that the CAC has rejected the use of the current PRAS as constituting a basis for mitigation and has formally requested the FAA to consider revision of the PRAS as part of an environmental review process. While the demographics may not have changed, community support of PRAS certainly has changed.
4. Page 6-56 of the document indicates that PRAS is discarded in favor of capacity and number of operations. How can a substantial portion of the EIS/EIR be based on PRAS achievement when it is stated that Massport/FAA will utilize configurations that favor capacity over PRAS goals? The noise contours presented in the document are based on the use of PRAS, but should have been based on actual aircraft operations associated with weather and FAA operating procedures in order to provide a realistic indication of future noise levels.

The EIS/EIR as it currently exists, is a public relations effort in support of the proposed Logan expansion. It is not a true examination of all available alternatives to reduce delays at Logan and has not addressed public concerns regarding expansion of Logan airport. Therefore, I would like to be placed on record stating my opposition to the Preferred Alternative described in the EIS/EIR due to the negative impact this project will have on the City of Somerville.

Sincerely,

Dorothy A. Kelly Gay

Dorothy A. Kelly Gay
Mayor

CITY OF SOMERVILLE, MASSACHUSETTS
OFFICE OF HOUSING & COMMUNITY DEVELOPMENT

DOROTHY A. KELLY GAY
MAYOR

STEPHEN M. POST
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Mary Jo Bohart
Paul Connolly
Sherri N. Geldersma
Jeffrey R. Levine
Christine Wrigley

May 31, 2001

Secretary of Environmental Affairs
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Mr. John C. Silva
Manager, Environmental Programs
Airports Division, ANE-600
New England Region
12 New England Executive Park
Burlington, MA 01803

Re: Proposed Logan Airside Improvements Planning Project
Final EIR (EOEA No. 10458)
Supplemental Draft EIS

Dear Mr. Pugsley and Mr. Silva:

As the Somerville representative to the Community Advisory Committee (CAC), I have had the opportunity to participate in several discussions with Massport and the FAA regarding the Proposed Logan Airside Improvements Planning Project. Upon reviewing the SDEIS/FEIR, I noted numerous inconsistencies and areas of analysis that appear to be inconsistent with the purpose of a true environmental review process. I concur with the information contained in the comments prepared by the CAC Consultants and submitted to you on May 23, 2001. The discussion below summarizes some of the issues that are of particular concern to the City of Somerville.

Noise

As the Honorable Mayor Dorothy A. Kelly Gay stated during the public hearing on April 25, 2001, the City of Somerville's primary objection to the document is the failure to address the concerns of Somerville residents and many other communities regarding the potential for an increase in noise that will occur as a result of the proposed Logan expansion. In fact, the concerns are dismissed because Massport determined that Somerville is located outside of the defined noise contour. The numerous complaints by communities that fall outside of the 65 dB DNL is an indication that Massport's assertion that this noise level represents a "threshold of

incompatibility of residential land use with aircraft noise" is not representative of actual experience.

In Massport's response to letters received by Somerville residents, Massport acknowledged that flights over Somerville will increase and stated, "the highest resulting noise exposure in [Somerville] is estimated to be on the order of 55 dB DNL." However, the document does not contain any explanation as to how this determination was made. Even if one assumes that Massport's estimate of 55 dB DNL is correct, this should be considered a significant noise level for Somerville to endure. As noted by experts in other comments that you have received (such as the consultants to the CAC), the 55 dB DNL contour should be used as the threshold of incompatibility with aircraft noise for the areas impacted by Logan. This revised threshold would include Somerville within the study area.

The study area for the SDEIS/FEIR is under-represented because it does not account for other areas that are impacted from noise from Logan. Massport does not have any noise monitors in the City of Somerville and excluded data from the noise monitors located in the surrounding communities of Everett and Medford in the noise models. This is of particular importance when one considers that the impacts on these communities are greatest during northwest wind conditions – the conditions under which proposed Runway 14/32 would be utilized. Therefore, the current noise levels experienced by communities stated in the SDEIS/FEIR are understated due to a lack of data for some areas. Therefore, the impacts of any expansion at Logan are not projected from a realistic baseline assessment of existing conditions. Permanent noise monitors should have been added to all communities affected by Logan flight paths as part of the analysis for the proposed project.

The document fails to use all appropriate measures of disturbance in assessing noise impacts. The failure to include consideration of sleep disturbance as a serious impact of nighttime noise grossly understates the true impacts of noise generated by overflights. In addition, the location of noise monitors and modeling often do not account for the topography of the areas northwest of Logan Airport. The topography of these areas is such that a number of hills are directly under the flight paths from Logan. Although some of these communities are located further from the runways than others, the elevated areas experience substantial noise impacts similar to other areas geographically closer to Logan. Somerville Alderman at Large, William White, submitted a letter to MEPA in April 1999 stating that he used "a Radio Shack Sound Level Meter to take measurements at Winter Hill. Depending on the altitude of planes, [he] measured up to 110dB outdoors and 75dB indoors with the windows closed." This factor should be considered in noise monitoring and abatement programs, and also speaks to the noise monitor issue discussed above.

Local Land Use Plans

The stated purpose of Section 7.4 is to discuss "the long-term cumulative effects of the proposed airside alternatives in the context of aircraft operations, and therefore focuses on a discussion of noise and air quality impacts." The document states, "The proposed Airside Project is consistent with local land use plans." The City of Somerville objects to this statement due to the impact this

project could have on the City's plan to revitalize several commercial districts, particularly Assembly Square.

Assembly Square is a 145-acre revitalization district at the northeast corner of the City and is the largest contiguous commercial/industrial area within the City. It includes 2/3 of the riverfront parcels in the City and has the greatest capacity for growth. It is located adjacent to the Mystic River, the designated flight path for Runway 33 departures. In 2000, the City completed a planning study of the district that recommended improvements that would allow the district to achieve a total buildout of at least 6 million square feet. Various public improvements are planned, including a new Orange Line station within the district, roadway improvements, renovations and expansions to the riverfront park, and improvements to pedestrian and bicycle access to the district. The City purchased a 9.3-acre railyard in 2000 that will be offered for redevelopment in the near future. That parcel will be the location of the planned MBTA station, and will also serve as the commercial hub of the district, where densities are anticipated to be the highest. In March of 2001, the City passed interim zoning that allows increased densities in return for higher amounts of open space and the meeting of design standards. The City is generally trying to attract office and R&D uses to the district, due to the higher tax revenues such uses generate.

An increase in the number of overflights in the vicinity of the Mystic River and resulting noise impacts is inconsistent with the City of Somerville's land use plans. Other regional land use plans such as the South Boston Seaport development would be adversely affected as well. These are just two examples of Massport's inconsistencies with land use plans.

Evaluation of Alternatives

The document presents several potential alternatives for evaluation in order to reduce delays at Logan Airport. However, Massport has chosen to focus most of the analysis on Alternatives 1A ("Preferred Alternative") and 4 ("No Build"), rather than presenting a fair comparison of the effectiveness of additional options. At a minimum, the SDEIS/FEIR should expand the analysis to include Alternative 2, which is all actions except Runway 14/32, including Peak Period Pricing. Alternative 3 may also achieve Massport's goal of delay reduction, would not include the costly option of a new runway, and could be implemented in a relatively short amount of time. Less intensive and lower capital expenditure options should be further explored before Alternative 1A is determined to be the "Preferred Alternative."

Massport states that peak period pricing is not effective under the 37.5 million High RJ Fleet scenario. Due to the major role that regional jets will play in operations at Logan, Massport should be required to explore additional demand management alternatives, besides peak period pricing in order to provide an effective "no-runway" alternative for delay reduction.

Regional Issues

The SDEIS/FEIR is inconsistent in determining the "impacted area" related to this project. The document makes much of the importance of Logan as a whole to the overall economy of the

region, but limits consideration of adverse impacts and mitigation to the specific project. The project must be considered within the context of the overall impacts that Logan Airport operations and activities have on the surrounding communities, including those outside of the 60 dB DNL contour. A comprehensive assessment of health effects of Logan operations on surrounding communities should be performed, regardless of the approval of the project.

It has been stated repeatedly throughout this process that a regional transportation plan is needed. Chapter 2 of the document discusses at length the role of Logan within the New England region and the operations of other airports. It also describes, in Section 2.93, "Massport's Initiatives in Support of Regional Alternatives." However, some of the more recent efforts such as the *New England Airports System Study* should have been completed prior to the SDEIS/FEIR in order to fully evaluate the proposed Logan expansion, rather than completed as an after-thought or follow up to a project proposal which will significantly impact the Boston area. This SDEIS/FEIR is the last real opportunity for the communities to have a voice in the future as determined by Massport and it is irresponsible for Massport to push this project through without completing the planning process. A true regional plan should include the goals of reducing the growth rate of jet aircraft operations at Logan to essentially zero. Absorbing passenger growth rate in larger aircraft with higher load factors and shifting passengers and freight to other modes of transportation and to other airports could accomplish this goal.

PRAS

Mayor Kelly Gay's comments during the April 25, 2001 public hearing focused on the inadequacies of the Preferential Runway Advisory System (PRAS) as a basis for the proposed project and the City's objection to the reference to PRAS as a response to Somerville residents' concerns. This section supplements those comments with additional concerns raised by the SDEIS/FEIR.

Section 4.3 states that PRAS was developed with input from community representatives. Why aren't the names of the communities listed? The list will most likely indicate that the communities northwest of the airport (including Somerville), which will be impacted the most by the Preferred Alternative and the "greater achievement of PRAS goals," were not involved in the development of the PRAS almost twenty years ago. The document states that twelve communities were represented in development of the PRAS but the CAC now represents twice that amount, with twenty-seven communities participating in the CAC. As noted by numerous public statements, the CAC no longer supports PRAS as it currently exists.

The use of PRAS for nighttime routing is of concern to the City of Somerville. Page 4-20 states "Whenever possible, controllers will simultaneously use 33L for arrivals and 15R for departures....Dwell and persistence are ignored at night so that this configuration can be used extensively, and when weather permits, controllers typically use this configuration for the full six-hour period."

- Why are dwell and persistence ignored at night when this is precisely the time when most people are disturbed from overflights? Although the flights take off and land over water,

many flights will turn back to cross over land to reach the final destination. The altitude of these "over-water" flights when they cross over land after takeoff and prior to landing impacts the noise in Somerville. This information is not provided within the PRAS discussion.

- Section 4.3.6 discusses the increased use of "overwater routing preferences" as a potential mitigation measure. What potential mitigation is proposed for the communities that are impacted by the overflights that turn back over land after takeoff?

Section 4.3.4.5 describes the "Historic Achievement of PRAS goals." This section includes a discussion regarding "exceeding PRAS goals" as a positive statement. This is misleading because in order to "exceed PRAS goals," a community would receive more than their so-called fair share of the air traffic and, therefore, a more significant noise impact. The statement on Page 4-62 "the predicated PRAS conformance nearly doubles with 14/32" is an indication that the impact on affected communities is double as well.

Airport Delays

The SDEIS/FEIR presents the proposed project as a delay reduction strategy and states on pages 4-57 and 4-58 that delays will be reduced by 27-31% (Low Fleet to High Fleet projections). However, the presentation of this data misleads the individual traveler to believe that the chance of an individual flight being delayed is reduced by 27-31% when, in actuality, the delay reduction would be far less. Page 1-30 states "the modeling results presented throughout the Draft EIS/EIR and this Supplemental Draft DEIS/FEIR represent only those delays that are attributed to Logan conditions." While this section goes on to describe issues such as "delays at other airports make up nearly 30% of the total capacity delays experienced by Logan passengers," these statistics are not included in the "Total Delay" discussion in Section 4.6.2. This is just one example of misleading information contained within the SDEIS/FEIR. We suspect that additional sources of delay such as mechanical problems and severe weather have also been removed from the analysis, causing the delay reduction attributed to the proposed project to be significantly less.

An additional issue related to delay reduction pertains to FAA's threshold for annual hours of delay. Table 4.6-2 indicates that total annual hours of delay will still be 100,000 to 200,000, depending on which fleet scenario is used. According to the document, "the FAA's threshold of 20,000 annual hours of delay which is used to identify severely congested (i.e., delay prone) airports" will still be greatly exceeded by Logan with the Preferred Alternative. Therefore, the Preferred Alternative seems to only marginally improve the problem and again overstates any delay reduction benefits that could be attained by the proposed project.

Demand and Capacity

Pages 4-8 and 4-9 discuss the decline in Logan non-jet activity. If the proposed Runway 14/32 is in part to accommodate turboprops, it seems that the decline in non-jet activity would be counter to the purpose of the proposed project. In addition, Massport's response to comments received by Somerville residents include statements such as "Total departures from Runway 33L and arrivals

to 15R would increase, but many of these are non-jets." Yet the SDEIS/FEIR contends that one of the benefits of Runway 14/32 is to accommodate additional jets on Runway 15/33. Inconsistent statements about the use of 14/32 and resulting use of 15/33 are confusing and misleading to the reader and do not provide an adequate evaluation of the impacts of the proposed project.

Pages 4-15 and 4-16 describe how "the construction of unidirectional Runway 14/32 does not increase Logan's normal airfield capacity of approximately 120 operations per hour. This capacity is available at Logan approximately 80% of the time." Inferring from the document, it seems that the capacity with two runways would be 90 operations per hour, and with one runway it would be 60 operations per hour. Increasing the amount of time that three runway configurations are available would increase the capacity of the airport, in spite of Massport's assertions that it would not. Even if one accepts Massport's argument that a new runway will not stimulate demand, the total number of flights will increase. Why is 120 operations per hour assumed to be the ultimate goal?

Air Traffic Distribution

The use of percentages throughout the document is misleading in determining the impacts of the proposed project. For example, page 4-63 states "the Preferred Alternative increases operations over water and achieves a more balanced distribution of operations over land." Table 4.6-5 presents the distribution of jet aircraft operations according to percentages to supplement this statement. However, the *actual number of flights* is not provided in this section and this is the information that is the most revealing. The TOTAL number of flights will increase and will be spread out over more communities. Table 4.6-5 misleads the reader to believe that flights to the north and south will be reduced when in actuality, these areas will essentially remain unchanged in terms of the total number of overflights. The percentage of flights is shown to decrease to the north and south because it is a portion of a larger total number of flights at Logan in general.

Northwest-Wind Restriction

Page 4-4 states "The proposed runway will improve Logan's reliability and reduce delays by preventing the decline in airfield capacity that now occurs in northwest winds." However, the document states that a "northwest wind restriction would sacrifice a portion of the delay reduction benefits that could be realized through unrestricted usage of unidirectional Runway 14/32." This contradicts Massport's position that the purpose of the proposed runway is to reduce delays during northwest-wind conditions and appears to support community concerns that this proposal is a document for capacity-building/expansion, not a delay-reduction proposal. The document further states, "decreased usage of Runway 27 [as a result of a wind restricted 14/32] corresponds with other, less desirable changes in runway utilization at Logan." These statements raise several questions:

- "Less desirable" to whom?
- Why are the numbers of people who would benefit from a wind restriction buried in the Appendix rather than being presented as part of the document? The Appendix indicates

that about 4,000 people in the 60-65 dB contour would benefit from a wind restricted Runway 14/32.

- Why isn't the total number of people that would benefit from a wind-restricted runway factored into the decision about what is more or less desirable?
- The increase in the number of flights on Runway 27 directly impacts the proposed South Boston Seaport development. Was this factored into the analysis for a wind-restricted 14/32?

Historic Properties

The document states that an historic property is defined as any site, building, structure, or object eligible for inclusion in the National Register of Historic Places that is within the 65 dB contour. The EOEA Scope included additional parklands that should be included in the analysis such as the Arnold Arboretum, Franklin Park, and the Emerald Necklace, even though each is well outside the contour line. Why weren't additional National Register sites included such as Bunker Hill in Charlestown and Prospect Hill in Somerville, both of which are also located outside of the 65-dB contour but are geographically closer to Logan? In 1776, the Continental Army raised the first "Great Union Flag" on Prospect Hill, Somerville. Several other significant historic properties in Somerville are located on hilltops such as the Old Powderhouse at Nathan Tufts Park and the Round House on Spring Hill. The location of these historic properties is pertinent to the topography and noise impact issues discussed above.

Conclusion

In summary, the City of Somerville continues to oppose the proposed Logan Airside Improvements Planning Project. The SDEIS/FEIR fails to address community concerns and has ignored many of the environmental impacts that this project will have on the Boston area.

Sincerely,

Christine Wrigley

Christine Wrigley,
Director, Transportation and Commercial Development
Somerville Representative, Community Advisory Committee (CAC)

C. WINTHROP

TOWN OF WINTHROP
NOISE, AIR POLLUTION AND AIRPORT HAZARDS COMMITTEE

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Winthrop, MA 02152

Chairman (617) 846-3433
Vice Chairman: (617) 846-6952

June 1, 2001

Secretary of Environmental Affairs
231 Causeway Street
Boston, MA 02114

Attention: MEPA Office
Arthur Pugsley – EOEA No. 10458

Re: Airport Hazards Committee Response to MEPA, et al

Dear Mr. Pugsley:

Enclosed please find the Airport Hazards Committee's Comment to the SDEIR, along with a copy of a letter recently sent to Attorney General Thomas F. Reilly.

Very truly yours,

JEROME E. FALBO
Chairman

JEF/am
Enc.
cc: John Silva, FAA, New England Region
Congressman Edward J. Markey
Congressman Michael C. Capuano
Senator Edward M. Kennedy
Senator Robert E. Travaglini
Senator John F. Kerry
Representative Robert DeLeo

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Vice Chairman: (617) 846-6952

Presented To Massachusetts Environmental Protection Agency (MEPA) and Federal Aviation Administration (FAA) on June 1, 2001

The Board of Selectmen of the Town of Winthrop and the Town of Winthrop Noise, Air Pollution and Airport Hazards Committee are unalterably opposed to the construction of the "unidirectional" runway 14-32, the center field taxiway and the lowering of the minimum height in which a pilot can decide to abort the flight.

The basis of our objection is that the irreparable environmental harm such construction would have on the Town of Winthrop and its neighboring cities and towns far outweigh the alleged temporary reduction of flight delays at Logan International Airport.

On May 7, 1997, Secretary Durand issued a certificate of adequacy re: Massport's Draft Environmental Impact Report. While we disagreed with that decision, the certificate contains significant and major demands of Massport aimed at protecting quality of life of the residents of the cities and towns adjacent to Logan International Airport.

Did Massport honor these demands: We think not.

We direct your attention to several points contained in the Secretary's Certification (Cert.) and how Massport responded.

First, on page 3 of the Certificate, the Secretary demanded that Massport produce a significant plan to improve ground access to Logan. Massport did not so provide.

Next, on pages 8, 11 and 12, the Secretary stated clearly ". . . .implementation of peak period pricing (PPP) leads to greater ***delay reductions*** (emphasis added) benefits equaling or exceeding those of RW14-32." How did Massport respond? On page 4 of the Executive Summary of the Logan Airside Improvements Planning Project (ES), Massport states that peak period pricing is not a recommended component of the preferred alternative but would be considered in the future!

On page 4 of the Cert., the Secretary required Massport to ". . . .develop a system of charging fees that would reward cleaner planes with lower charges." "The polluter pays." Massport announced it will commence a program of charging the airline an amount and use the funds to reduce or eliminate toxic emissions on all airport vehicles and all equipment except aircraft, the single, largest polluter. So, the airlines pay a tax to continue to pollute.

The Secretary did not "fully accept Massport's contention that the airside improvements will not increase capacity." Accordingly, he demanded Massport incorporate in its final EIR a list of mitigation measures.

How well did Massport score on the requested list?

1. The Secretary demanded that the FEIR must report on ground access to the 4 airports (Logan, T. F. Green, Manchester and Worcester. MASSPORT MERELY COMMENTS ON THE WIDENING OF RT. #3.

2. Cumulative Impacts of the proposed Construction (cert. P.13): The Secretary emphatically stated that FEIR cannot be received in "isolation" from overall airport operation and impacts as a whole. Massport comments were only on the cumulative affect of this project specific which, in fact, "isolated" the project from over-all airport operations.

We have recently received information that further demonstrates Massport's total disregard of the health and welfare of its neighbors. Massport has refused to enforce sections of its own CMR (see copy of letter to Attorney General Reilly attached and incorporated in this response). Aircraft are allowed to idle on the existing taxiway in numbers far in excess of the CMR limitation. A new centerfield taxiway would allow this violation to continue. Also, it can be argued that since the centerfield taxiway is not referred to in the CMR, it would be exempt from its provisions.

At the time that FAA Administrator Jane Garvey formed the six member panel, she expressed a desire that the panel would study the project objectively and in its entirety. She hoped that the members in opposition of the project as well as those in favor would consider that if the study warranted, a unfavorable report for one side or the other, they would admit they were wrong. This never happened. The panel's study was confined to a review of the "Brown Book," Massport's EIR. Elizabeth Higgins, senior EPA policy analyst, in a secret note to FAA regional airports manager Vincent Scorano urged him to take the Brown Book "off the table." She stated in her note, "It is a pro-runway advocacy document, not a neutral document."

With respect to airport noise, since the SDEIS/SDEIR shows that a direct consequence of runway 14/32 would be a doubling of takeoffs on runway 27 which would severely impact the already overburdened Point Shirley and Pleasant Park neighborhoods of Winthrop we must oppose runway 14/32. We are opposed to the

planned centerfield taxiway because it would bring noise and emissions from taxiing aircraft presently on the November taxiway much closer to the Court Road neighborhood. And we are opposed to the proposed lowering of the runway 221 bad weather instrument landing mimima because of the consequential increase in aircraft landings on this flight track which would mean more noise for the Court Road and Belle Isle areas.

In his November 10, 1999 Certificate regarding the scope for the 1999 Logan Airport Environmental Status and Planning report Secretary Durand states that "Logan Airport currently ranks as the sixth largest source of NOx emissions in the Commonwealth, and by 2010 it is likely to become one of the three largest such sources. Currently, aircraft emissions are the only mobile source air pollution sources included in the State Implementation Plan (SIP) emissions inventory that are not slated for meaningful near- or long-term emissions reduction".

Because the 1999 Logan Environmental Status and Planning report clearly demonstrates that Massport's planned introduction of increased numbers of Stage 3 aircraft will directly contribute to a major increase in NOx emissions from Logan Airport thereby worsening the health of the citizens of Winthrop, and because the 14/32 runway, centerfield taxiway and reduced bad weather landing minima would measurably increase the capacity of Logan Airport to accommodate these Stage 3 NOx generating aircraft we urge the Massachusetts Environmental Protection agency and the Federal Aviation Agency to disapprove all three proposals.

Such expansion would not be necessary if a comprehensive, objective study of the integration of regional intermodel transportation, i.e. promote utilization of our regional airports, access to Worcester Airport from the Mass Pike, allowing Manchester and T.F. Green airport buses access to Logan Express locations, North-South Station link, and the high-speed rail system. The study should begin now and its recommendations implemented forthwith.

We urge Secretary Durand to determine that SDEIR is inadequate primarily because of Massport's failure to follow the recommendations contained in his certification. Massport should be and can be a major player in developing a sound intermodel regional transportation system, but Massport must be stopped from expanding Logan International Airport.

Respectfully submitted,

JEROME E. FALBO
Chairman

MEMBERS
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May 17, 2001

Attorney General Thomas F. Reilly
Office of the Attorney General
One Ashburton Place, 20th Floor
Boston, MA 02108-1698

Re: Massport-Violation of 740CMR

Dear Attorney General Reilly:

The Massachusetts Port Authority is presently attempting to expand Logan International Airport with a series of projects, including construction of a new runway (14-32), a centerfield taxiway and a reduction of the height at which a pilot must decide to abort a landing. We are unalterably opposed to these projects which would adversely affect the quality of life for Winthrop and our neighbors in East Boston.

It has been well documented that Winthrop and its neighbors suffer from intolerable levels of noise and toxic emissions as a direct result of Logan's operations. Yet Massport not only refuses to investigate viable alternatives to the proposed expansion but continually refuses to enforce certain aspects of its own Code of Massachusetts Regulations!

Massport refuses to enforce 740 CMR 24:05:6 which was established to limit the number of jet aircraft idling on the taxiway awaiting takeoff clearance. Presently, long, unauthorized lines of such aircraft cause excessive and unnecessary amounts of pollutants into the air breathed by Winthrop and its neighbors. Construction of the centerfield taxiway would allow these code violations as well as circumvent the code.

As a result of a recent health study conducted in Winthrop, it was found that the residents abutting the runways suffered from a much higher rate of respiratory illnesses.

This study was a key factor in the legislature appropriating funds for the Department of Public Health, Commonwealth of Massachusetts to conduct a similar study in all cities and towns within a five mile radius of Logan. That study is presently in its infancy. Again, Massport ignores our request to await the results of the study prior to embarking upon a massive expansion program.

Because Massport refuses to enforce these critical aspects of 740CMR which would provide relief to Winthrop and its neighbors and obviate the need of a centerfield taxiway, we respectfully ask you as the people's lawyer to intervene on our behalf. We urge you to take whatever action necessary and within your authority to enforce these important state environmental regulations.

Respectively submitted,

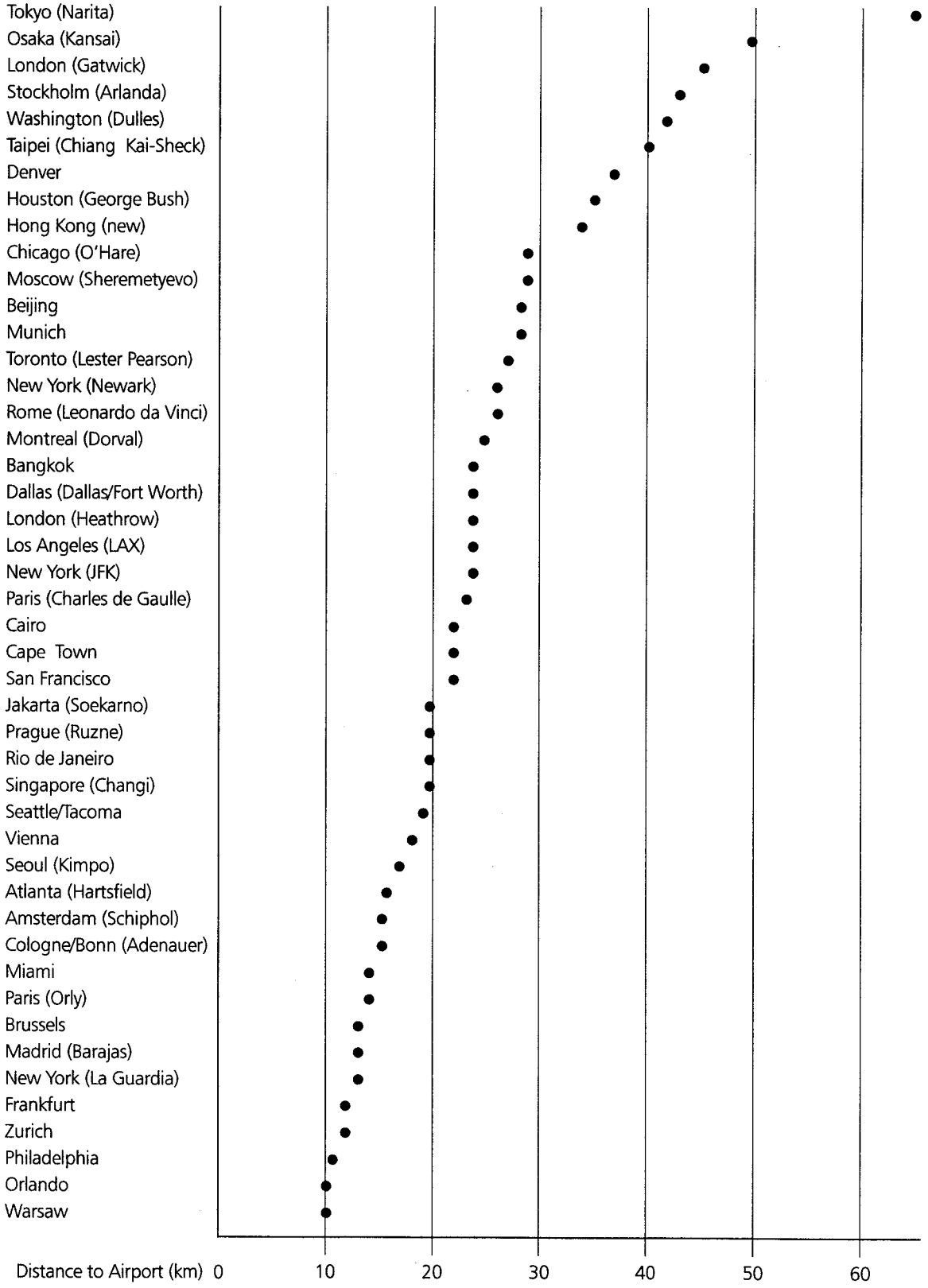
JEROME E. FALBO
CHAIRMAN

JEF/am
cc: Arthur Pugsley, MEPA
John Silva, FAA, New England Region
Congressman Edward J. Markey
Congressman Michael C. Capuano
Senator Edward M. Kennedy
Senator Robert E. Travaglini
Senator John F. Kerry
Representative Robert DeLeo
Brian M. Clark

How far to the airport?

17.119

Massport says that to be a world-class city Boston requires a growing downtown airport. As the chart below shows clearly, most world-class cities choose to put the airport at a distance, where it is less disruptive. The average distance for the list below is more than 24 kilometers, and the median is more than 22 kilometers. In fact, any attempt to grow its downtown airport would put Boston seriously out of step with the usual practice of world-class cities, which has been to supplement and replace close-in airports, not to grow them.



Fixing Logan delay: 2 methods

17.120

Build Runway 14/32	Regionalize & manage demand

How reliable is the method?

Building a short runway to reduce delays has been tried, and has failed, at Philadelphia and at Baltimore. Current fleet mix data indicate it will fail at Logan as well. The short runway cannot be used by the regional jets which are now replacing turboprops.

In the 1980s demand management at Logan reduced delays from 2nd in the country to 19th. It worked then and can work today.

When will delay reduction benefits become available?

Maybe never. Airlines want to preserve gate monopolies at major airports, keeping rivals out. One method is to increase flights to soak up any newly created capacity. The advent of new smaller "regional jets" will only make this tactic easier. In any case, there will be at least 2–3 years for construction.

As soon as a demand management method has been approved, it can be implemented. If Massport started now to plan demand management, it could have it working and producing benefits before construction on a new runway could even begin. Demand management is a much quicker solution.

How long will delay reduction benefits continue?

At best, Runway 14/32 is a short-term fix for an abiding problem which will soon get much worse unless steps like demand management and regionalization are added to the mix. Massport's figures show delays continuing to skyrocket even with 14/32.

Aviation experts agree that regionalization is the only method, other than construction of a new airport, which can provide long-term delay-reduction benefits for the New England region, and at the same time accommodate growth.

What is the cost?

Massport has been vague about the cost of Runway 14/32. A similar runway completed in December 2000 cost $210 million and has proven unusable by regional jets.

Because demand management is free of major capital expenditures, it pays for itself instantly with the increased landing fees which are the principal management tool.

Who pays?

Each member of the traveling public pays in two ways: increased landing fees to offset capital expenditures; and by enduring delay. Employers pay for lost time by business travelers, and for more expensive tickets at a monopolized airport.

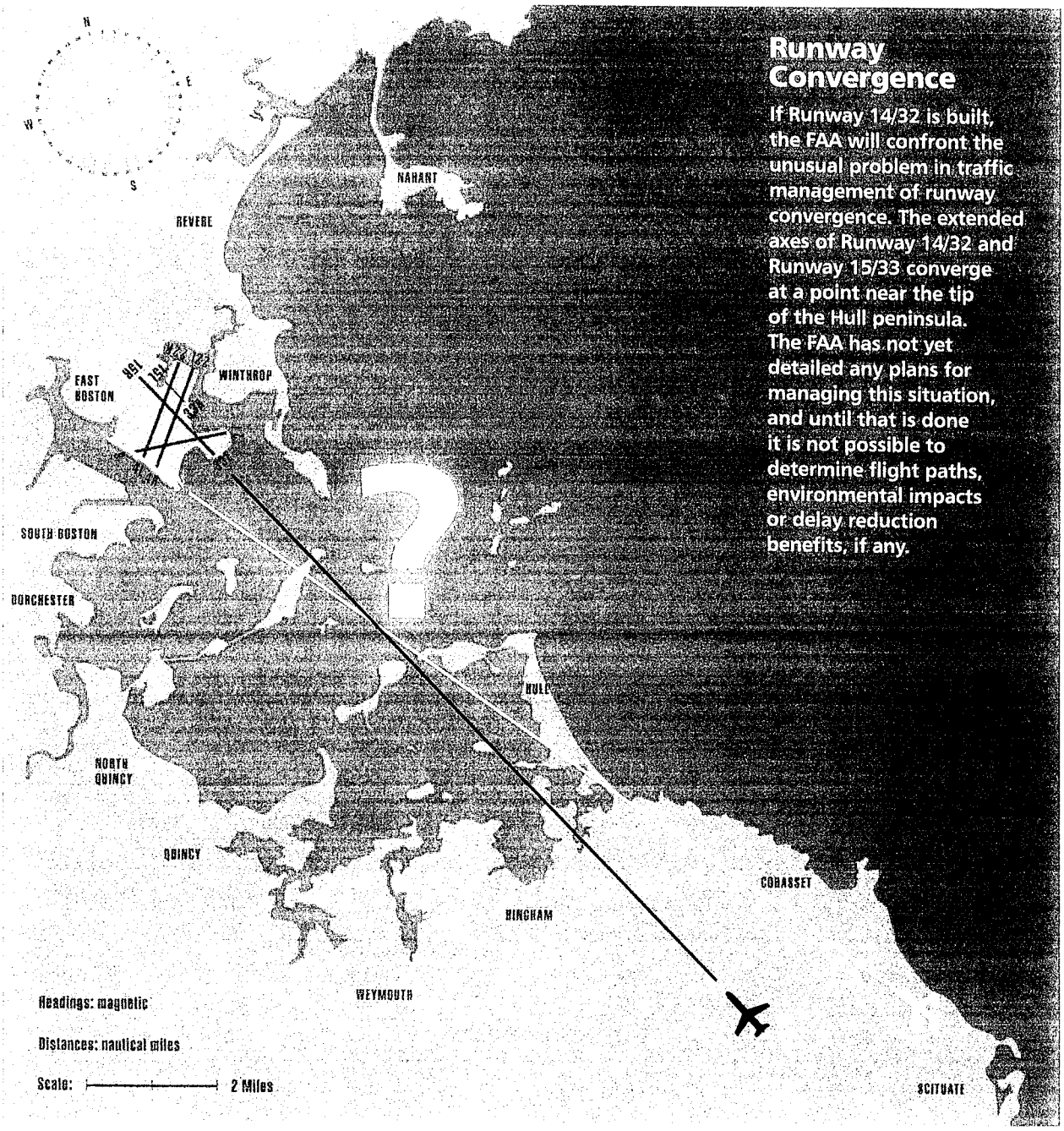
Travelers who choose to travel at peak travel periods pay ticket surcharges. Others get discounts for traveling during times of lower demand. Because demand management boosts effective airport capacity competition lowers ticket prices generally.

What about the environment?

The Runway 14/32 project is about enabling opened-ended growth at Logan, regardless of the consequences for delay or for Logan's neighbors. This means that both the traveling environment and the living environment throughout the Boston area will spiral down continuously if Runway 14/32 is built.

Regionalization dilutes impacts on the living environment, sharing them more equitably and reducing the total number of affected people by moving some impacts out of the Boston area. Regionalization also enables a planning process which can reduce environmental impact sources overall.

There is No Airspace Design Analysis for Runway 14/32


Runway Convergence
If Runway 14/32 is built, the FAA will confront the unusual problem in traffic management of runway convergence. The extended axes of Runway 14/32 and Runway 15/33 converge at a point near the tip of the Hull peninsula. The FAA has not yet detailed any plans for managing this situation, and until that is done it is not possible to determine flight paths, environmental impacts or delay reduction benefits, if any.
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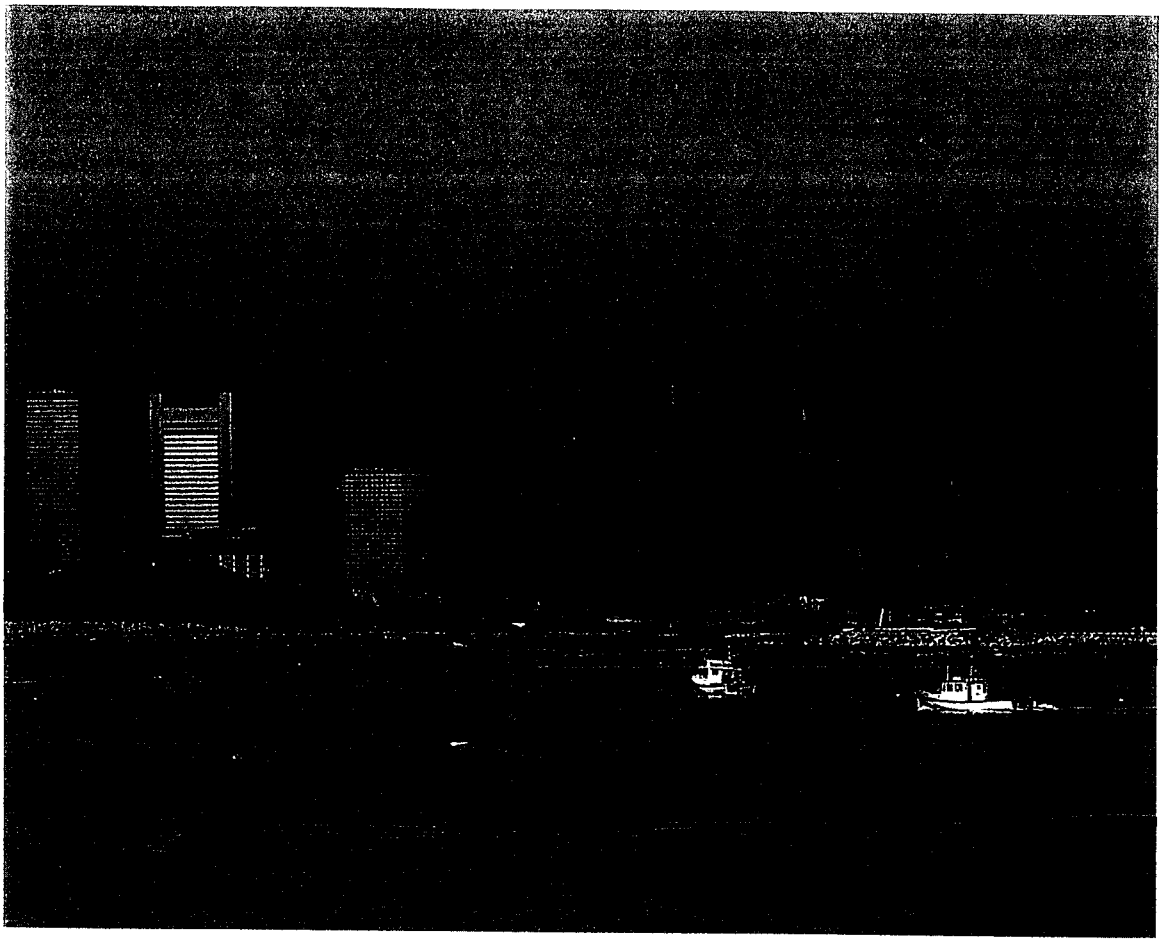
NAHANT
REVERE
EAST BOSTON
WINTHROP
SOUTH BOSTON
DORCHESTER
HULL
NORTH QUINCY
QUINCY
COHASSET
HINGHAM
WEYMOUTH
SCITUATE
Headings: magnetic
Distances: nautical miles
Scale:
2 Miles

Massport and the FAA plan to land aircraft simultaneously on Runway 32 and Runway 33. However, contrary to standard design configurations, these runways are not parallel. Without an airspace design analysis to address convergence and such other critical safety issues as missed approaches, it is impossible to accurately determine flight paths, environmental impacts and delay reduction benefits, if any. Delay reduction benefits are reduced significantly or possibly eliminated if aircraft must approach both runways in a single flight path. Analysis is further hampered by the fact that the alignment of Runway 14/32 has not been disclosed in the SDEIS/FEIR. It could vary by up to 8 degrees—an uncertainty large enough to shift the flight path and its associated impacts as much as 1.3 miles at the 10-mile distance from the airport where descending airplanes begin to be seriously annoying on the ground.

Massport's False Air Emissions Analysis is a "Fatal" Flaw



A low-level temperature inversion envelops downtown Boston in choking smog. Logan airport is a major emissions contributor, but fails to address how it will reduce emissions to meet stringent federal air quality standards to protect Boston area residents from the harmful and possibly fatal effects of air pollution.

Massport's failure to include accurate air emissions inventories for its Preferred Alternative renders the SDEIS/FEIR inadequate.

Massport's presentation of false information which it fraudulently presents as air emissions inventories for its Preferred Alternative is a serious violation of federal and state law.

Massport's failure to provide such required basic air emissions data and Massport's deceptive effort to cover up its fatal omission is illustrative of Massport's shocking and careless disregard for the health and wellbeing of the citizens of Massachusetts.

Massport's False Air Emissions Analysis—CO

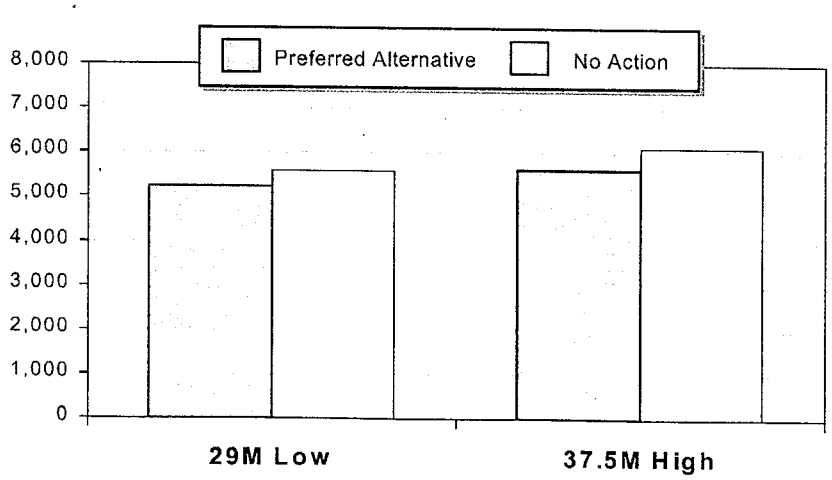
Table ES-1
Logan Airside Improvements Alternative Packages

Improvement Concept	Alternative 1 All Actions	PREFERRED ALTERNATIVE Alternative 1A All Actions Except Peak Period Pricing	Alternative 2 All Actions Except Runway 14/32	Alternative 3 No Build	Alternative 4 No Action
Runway 14/32	■	■			
Taxiways:					
Centerfield	■	■	■		
Extend Delta	■	■	■		
Realign November	■	■	■		
South West Corner Optimization	■	■	■		
Operational:					
Reduced Minimums	■	■	■	■	
Peak Period Pricing	■		■	■	

Table 6.4-4
CO Emissions Inventory - All Sources

Alternative	29M Low Fleet Scenario		37.5M High Fleet Scenario	
	kg/day	tons/year	kg/day	tons/year
Preferred Alternative - All Actions	13,022	5,239	13,976	5,623
No Action Alternative	13,905	5,594	15,236	6,129
1997 Annual Update	14,470	5,821	16,686	6,713

Figure 6.4-2
CO Emissions Inventory – All Sources (ton/year)



Massport's False Air Emissions Analysis—NOx

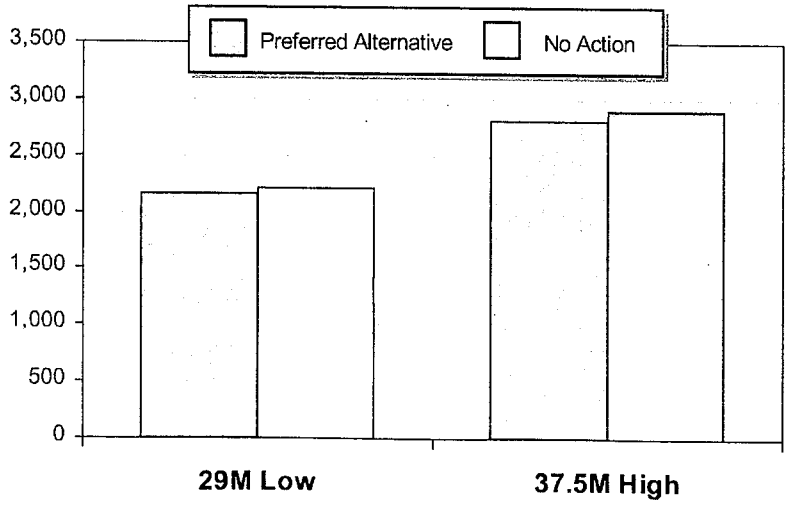
Table ES-1
Logan Airside Improvements Alternative Packages

Improvement Concept	Alternative 1 All Actions	PREFERRED ALTERNATIVE Alternative 1A All Actions Except Peak Period Pricing	Alternative 2 All Actions Except Runway 14/32	Alternative 3 No Build	Alternative 4 No Action
Runway 14/32	■	■			
Taxiways:					
Centerfield	■	■	■		
Extend Delta	■	■	■		
Realign November	■	■	■		
South West Corner Optimization	■	■	■		
Operational:					
Reduced Minimums	■	■	■	■	
Peak Period Pricing	■		■	■	

Table 6.4-5
NOx Emissions Inventory - All Sources

Alternative	29M Low Fleet Scenario		37.5M High Fleet Scenario	
	kg/day	tons/year	kg/day	tons/year
Preferred Alternative – All Actions	5,362	2,157	6,997	2,815
No Action Alternative	5,491	2,209	7,183	2,890
1997 Annual Update	6,670	2,683	8,343	3,356

Figure 6.4-3
NOx Emissions Inventory – All Sources (ton/year)



Total Jet Flights Affecting Communities Before & After Runway 14/32*

17.121

Bayswater,* Constitution Beach, Orient Heights, Revere, Winthrop*

Annual flights before 14/32: 28,900

Annual flights after 14/32: 37,000

Change: +28%

Directly affected by:
Runway 22 arrivals
Runway 4 departures

**Airport-bordering communities get additional direct impacts from nearly all runways*

Southern Winthrop,* Point Shirley

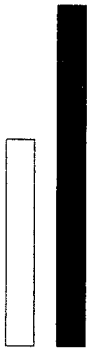
Annual flights before 14/32: 111,800

Annual flights after 14/32: 184,400

Change: +65%

Directly affected by:
Runway 27 arrivals
Runway 9 departures
Runway 27 departures

**Airport-bordering communities get additional direct impacts from nearly all runways*



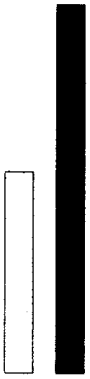
Cohasset, Hingham, Hull, Eastern Weymouth

Annual flights before 14/32: 109,200

Annual flights after 14/32: 200,000

Change: +83%

Directly affected by:
Runway 33 arrivals
Runway 32 arrivals
Runway 15 departures
Runway 14 departures
Runway 22 departures (partial)
Runway 9 departures (partial)



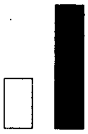
Quincy, Western Weymouth

Annual flights before 14/32: 27,400

Annual flights after 14/32: 67,200

Change: +145%

Directly affected by:
Runway 4 arrivals (partial)
Runway 32 arrivals (partial)
Runway 33 arrivals (partial)



Braintree, Dorchester, Milton, North Quincy

Annual flights before 14/32: 60,100

Annual flights after 14/32: 105,200

Change: +75%

Directly affected by:
Runway 4 arrivals

Eastern South Boston*

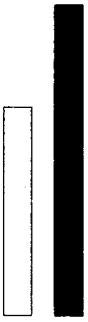
Annual flights before 14/32: 112,800

Annual flights after 14/32: 168,300

Change: +49%

Directly affected by:
Runway 4 arrivals
Runway 32 arrivals
Runway 22 departures
Runway 14 departures

**Airport-bordering communities get additional direct impacts from nearly all runways*



Jamaica Plain, Roxbury, South End, Western South Boston

Annual flights before 14/32: 22,600

Annual flights after 14/32: 71,800

Change: +218%

Directly affected by:
Runway 27 departures

East Boston,* Chelsea, Everett, Somerville

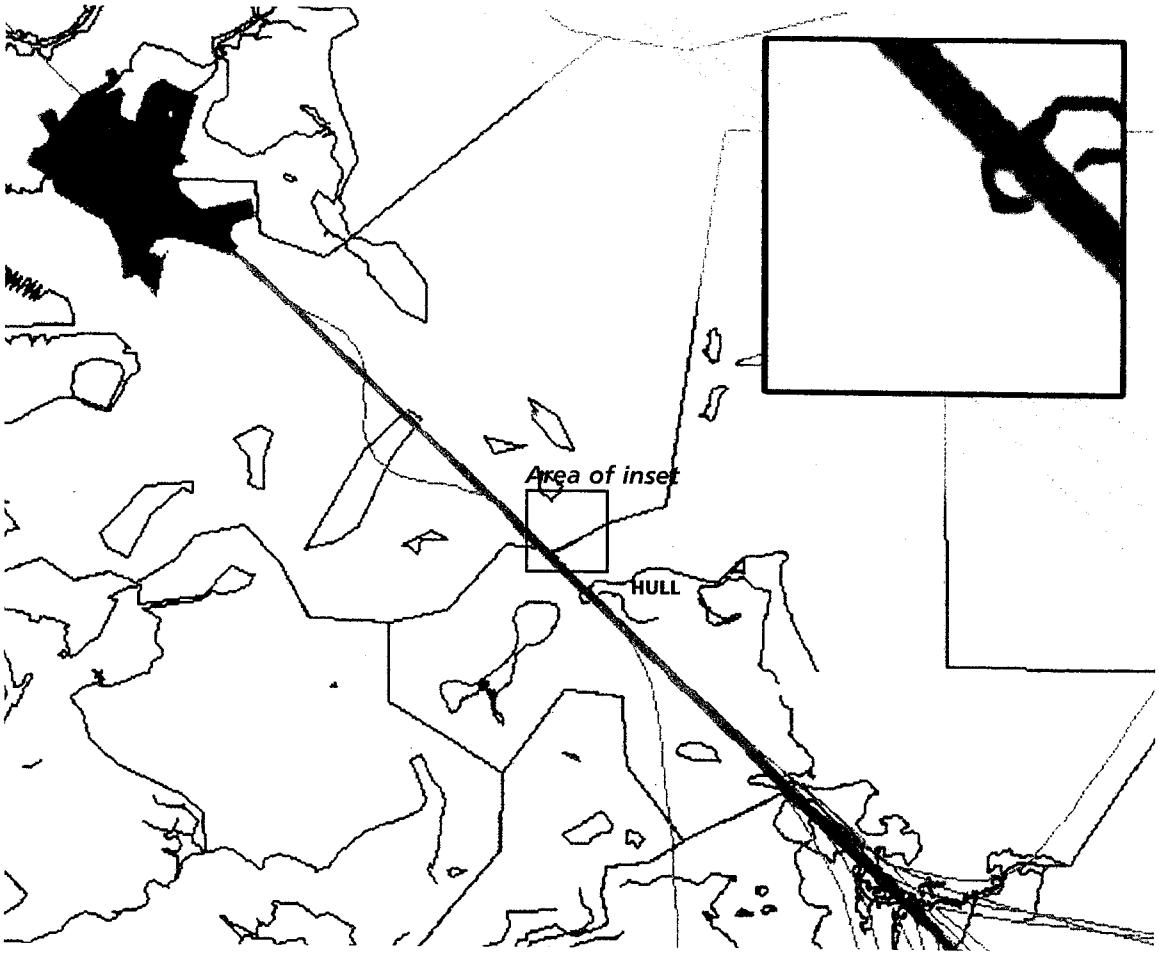
Annual flights before 14/32: 11,300

Annual flights after 14/32: +199%+??
Massport's unexplained omission of the highly efficient Runways 32/27/33 operational configuration from the SDEIS/FEIR rules out accurate estimates. Odoni of MIT has cautioned that increases could be larger than Massport numbers. Departure numbers could grow to extremes if that configuration becomes the tower's preferred high-capacity configuration.

**Airport-bordering communities get additional direct impacts from nearly all runways*

Source: Massport, SDEIS/FEIR, Volume 3, Appendix on Delay: Table 2 "Total Annual Jet Operations by Community, Runway End and Alternative". Baseline data from 1999, comparison data for Alternative 1A 2015 High RJ Fleet. (Data adjusted where experience shows impacts unattributed by Massport, such as Runway 22 departures in Hull.)

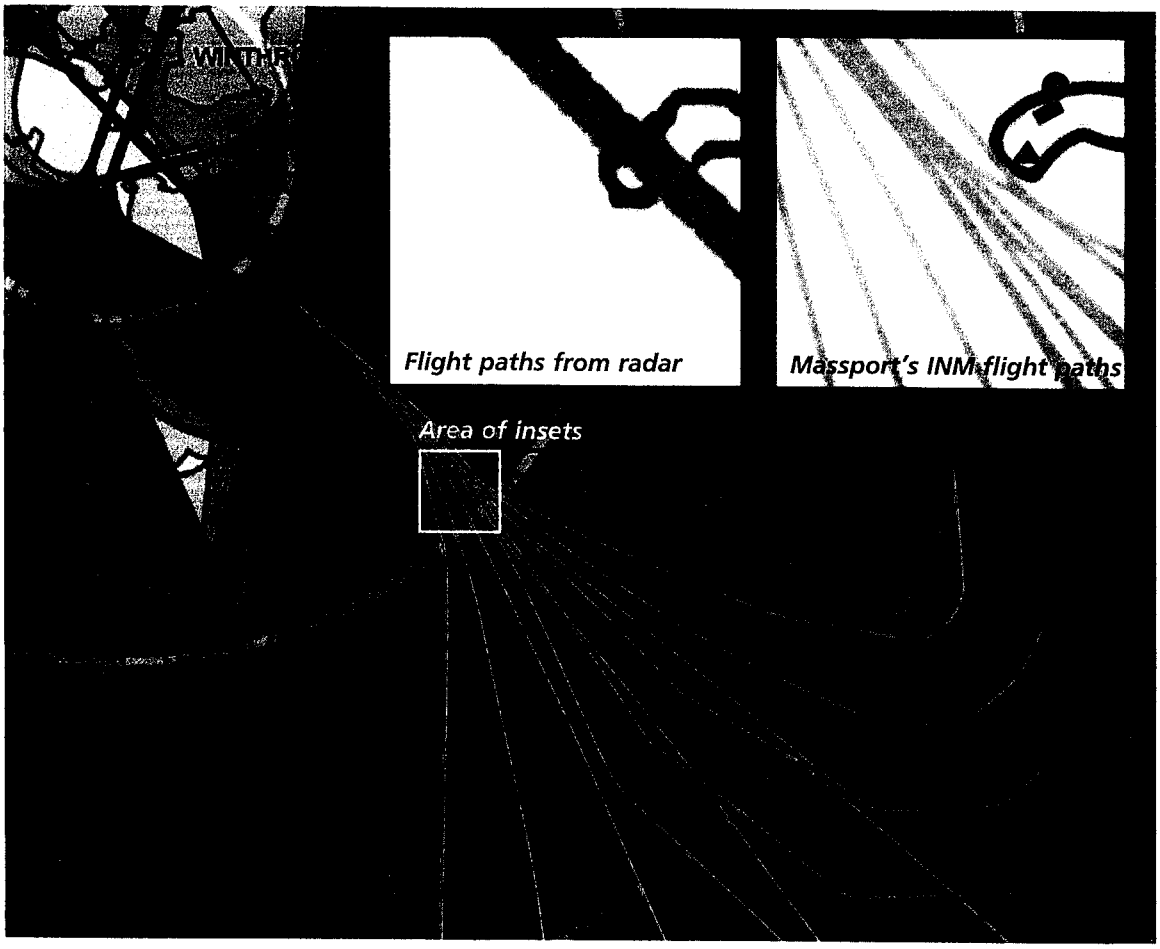
Radar Data Show Actual Runway 33L Flight Paths



RADAR TRACKS show approach to Runway 33L. Illustration is a scan of radar tracks supplied by the Massport noise abatement office in response to a request for actual flight tracks representing jet arrivals on Runway 33L during Visual Flight Rules conditions. The tracks sampled represent 102 jet arrivals which occurred between 16:00 and 20:30 on January 14, 2000. All 102 arrivals recorded radar tracks on Massport's sample. However, almost all were aligned on final approach before they arrived at the end of the Hull peninsula, and as a result their tracks are superimposed upon each other and are not individually visible. This is the normal situation for Runway 33L approaches in that vicinity. The inset at upper right shows an enlarged view of the tip of the Hull Peninsula, and is compared as well to another inset on the facing page. Note that the radar tracks all cross the shoreline at the end of the peninsula, and then recross it to traverse Boston Harbor on their way to Logan. Jets at this point on the approach path fly at an altitude of approximately 1,400 feet, and usually pass directly, or nearly directly, above Hull High School.

The shore of Peddocks Island, which would normally appear in the lower left of the insets on both pages, has been removed to provide a clearer view of the flight tracks.

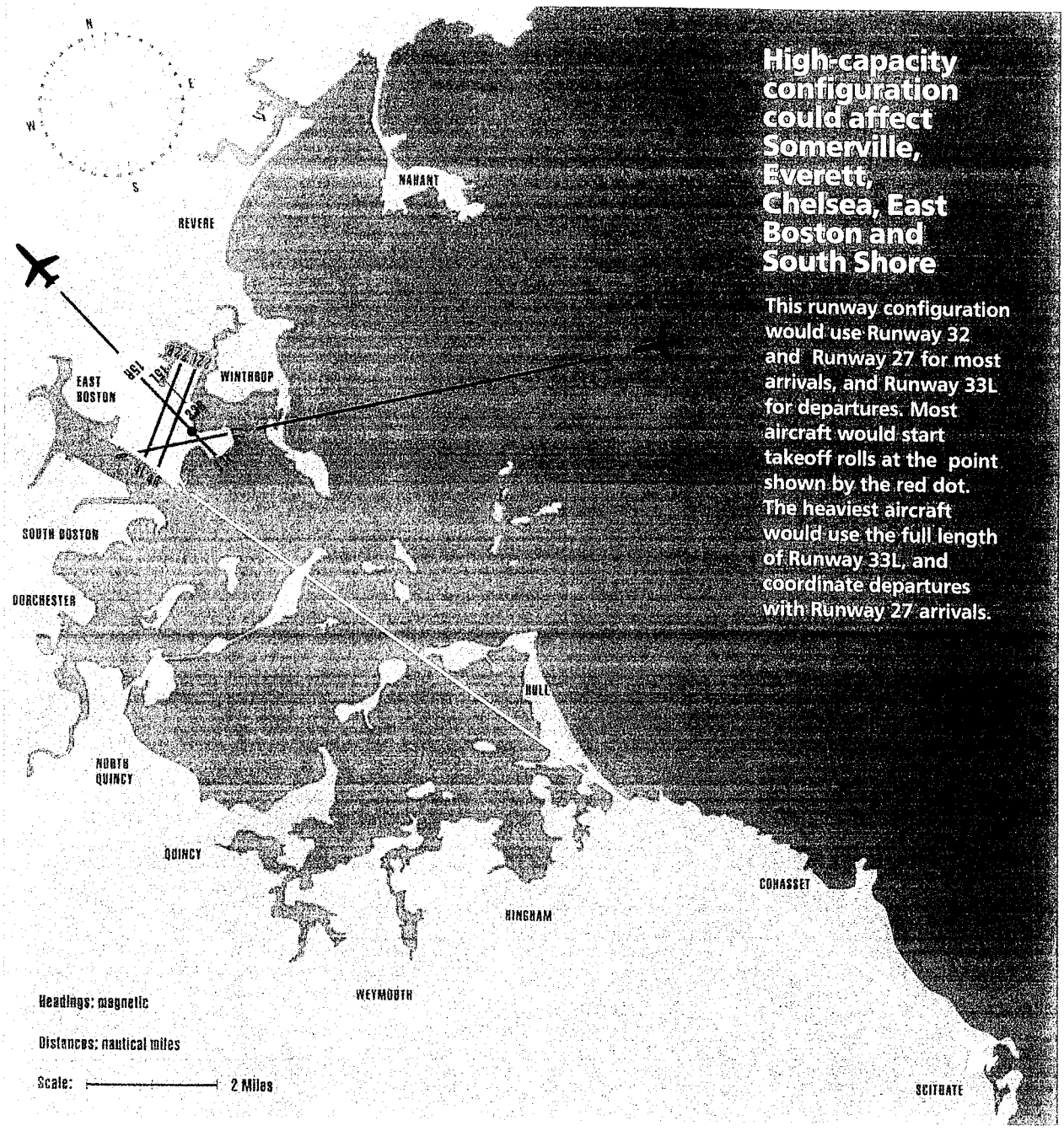
Massport's False Runway 33L Approach Skews Noise Model



INACCURATE FLIGHT TRACKS from the Integrated Noise Model used to model jet approach paths to Runway 33L. The illustration above appears as Figure ES-6 in the SDEIS/FEIR. It shows 10 flight paths (yellow here, but low-contrast green in the original) which were used as input to the INM. Combining that data with other data representing aircraft operations, the INM generated noise contours for the vicinity of the end of the Hull peninsula. These contours were inaccurate, partly because the flight tracks shown above are not properly located. The right inset above is a magnification of the end of the Hull Peninsula. It shows the INM flight tracks have been shifted to the west, away from Hull High School, (grey rectangle), away from the Hull High School noise monitor (red circle), and away from the outer marker for Runway 33L (red triangle). It is located by the High School parking lot. Pilots try to fly directly over the outer marker to align their approach to the runway. Compare the flight tracks in the right inset above with the radar data presented in the left inset. 17.122

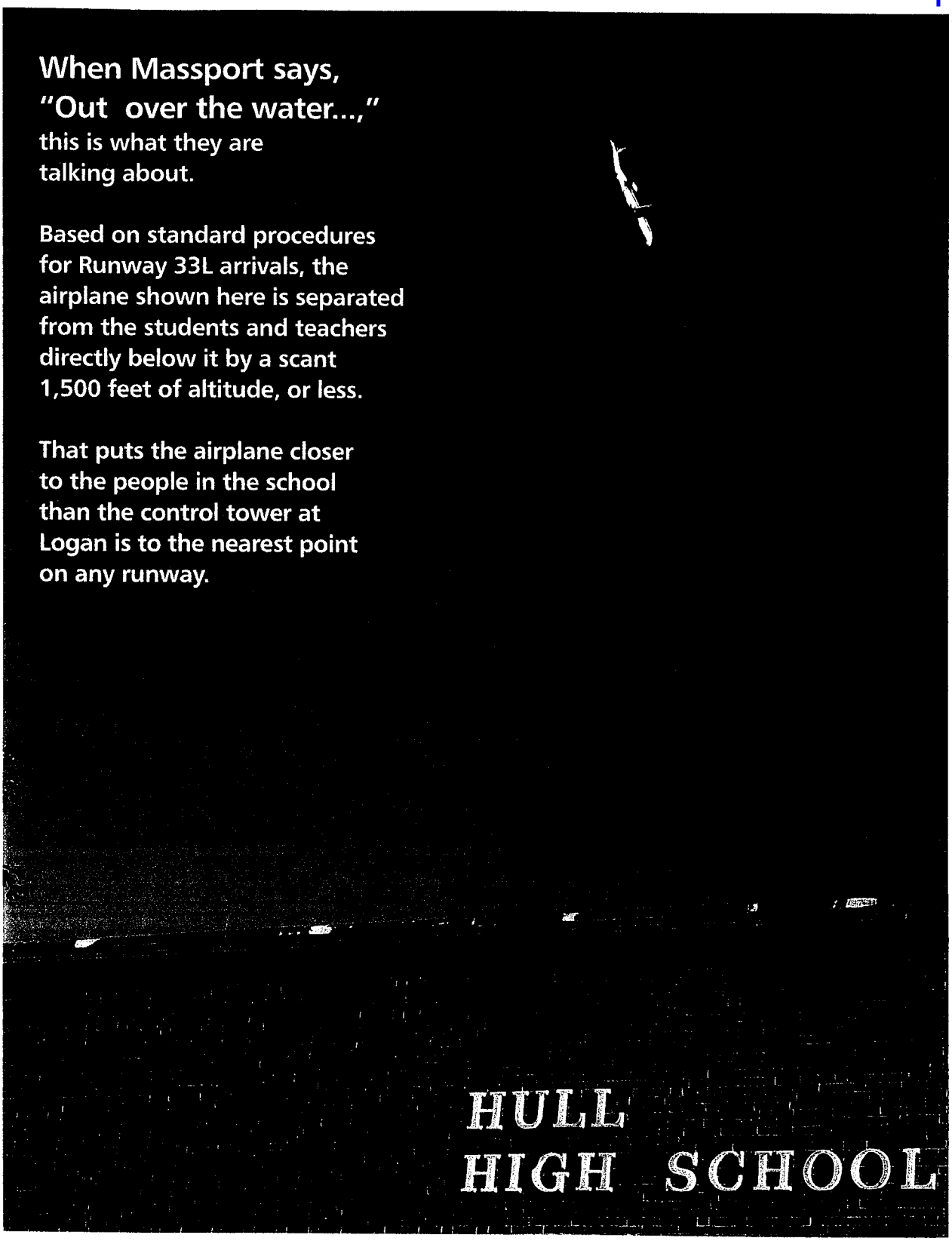
Other Massport documents, notably the 1999 Environmental Status and Planning Report, have presented flight tracks for arrivals on Runway 33L which exactly match the radar data, Those accurate flight tracks, which were also used for INM contour drawing in another context, were not used in this SDEIS/FEIR. Massport has ignored requests from commentors on the DEIS that it supply information about how the INM flight tracks used in its environmental assessments were chosen and validated.

Unanalyzed impacts: Somerville, Everett, South Shore



This runway configuration, noted briefly in the DEIS, seems to have vanished without a trace in the SDEIS/FEIR. Remarkably, it could become the highest-capacity configuration at Logan, and the default configuration chosen by the Logan tower whenever conditions permit. Environmental impacts in communities northwest of the airport, also including East Boston, would be much higher than the DEIS/FEIR has stated, a possibility noted by Professor Odoni of MIT when he addressed the Garvey Panel. The South Shore would also be heavily affected. The point is that this configuration offers controllers the least interference between arriving and departing aircraft available at Logan.

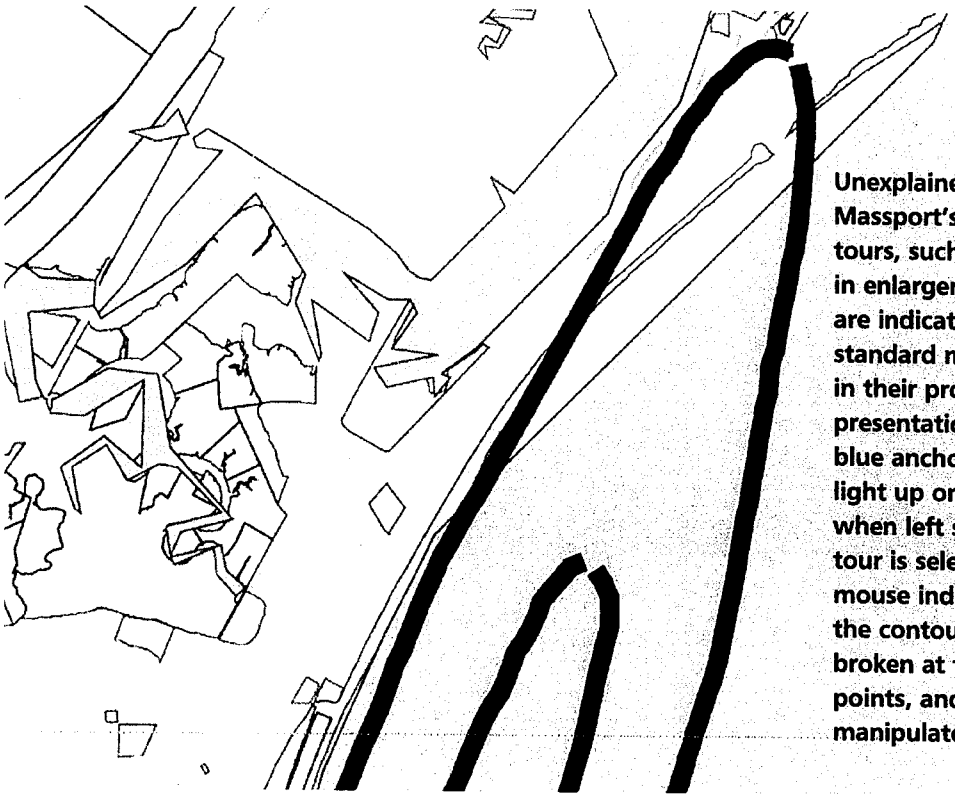
17.123


When Massport says,
"Out over the water...,"
this is what they are
talking about.
Based on standard procedures
for Runway 33L arrivals, the
airplane shown here is separated
from the students and teachers
directly below it by a scant
1,500 feet of altitude, or less.
That puts the airplane closer
to the people in the school
than the control tower at
Logan is to the nearest point
on any runway.
HULL
HIGH SCHOOL

AMAZINGLY, Massport's DEIS/FEIR says the situation pictured above will not create environmental impacts significant enough to be worth studying or disclosing, even if school overflights increase to more than 100,000 per year. The data and analysis in the DEIS/FEIR are flawed, and in some cases misleading, deceptive and fraudulent.

Massport's Noise Contours are Inaccurate and Deceptive

17.124



Unexplained gaps in Massport's noise contours, such as those seen in enlargement at left, are indicative of non-standard methods used in their production or presentation. Failure of blue anchor points to light up on right side when left side of contour is selected by the mouse indicates that the contour has been broken at two or more points, and possibly manipulated.

This enlargement of a section of Massport's noise contour near Carey Circle in Revere shows flaws which cast doubt on the integrity of Massport's contour production and presentation methods. (From Figure 6.2-13, SDEIS/FEIR, CD-ROM)

Graphical Integrated Noise Model output is performed using a program called NM Plot. This program was developed by the U.S. Airforce and is used by the DOD and most of DOT to draw noise contours. Discussions with the program developer (Fred Wasmer, private communication) indicate that the INM output for any single noise contour, (e.g. DNL 65) is a single set of vector points forming a closed polygon. That is, each noise contour is internally represented in the computer as a single mathematical object, and is individually selectable in its entirety with the mouse by using a single mouse click.

The PDF files supplied by Massport on the CD ROM version of the SDEIS/FEIR contain noise contours which are not single closed polygons. Several of the contours, instead of being contours, are really two separate curved line segments. These contours as presented by Massport could not be the direct computer output from NM Plot. If they ever were NM Plot output, then they have been edited in some fashion, or otherwise altered.

It has been noted elsewhere that the noise contours as presented by Massport sometimes do not properly follow the extended alignments of the runways. It has also been noted that tabular noise data presented by Massport, both for INM output and for noise monitor reports, does not properly agree with the noise values represented by the contours, sometimes missing the proper values by large amounts. Editing or alteration of the contours could account for those discrepancies.

APPENDIX A

Excerpts from Boston Logan International Airport: Airport Capacity Enhancement Plan (October 1992)

Boston Logan International Airport

Airport Capacity Enhancement Plan

October 1992

Assumptions

In order to evaluate the 27 potential airport improvements, certain standard inputs were used to reflect the Logan operating environment. Some of these inputs were based upon observed data, and others were based on assumptions made by the Capacity Team. Details may be found in the various data packages produced by the Technical Center. The more significant details are summarized below:

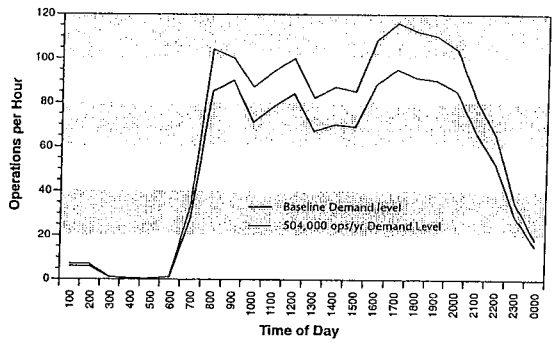
Traffic Volume. Three levels of annual operations were assumed:

412,000 -- approximating the 1987 level of demand

450,000 -- an intermediate level of demand

504,000 -- a longer-range demand level, approaching Logan's ultimate airfield capacity

(The Capacity Team did not assign forecast years to these scenarios.)



Profile of Daily Demand Hourly Distribution

Fleet Characteristics

Aircraft Class	Aircraft Types	Peak Hour		Departure Runway Occupancy Times	Approach Speeds
		Airfield Mix	Annual Fleet Mix		
Class 1	Under 12,000 lbs.	6%	3%	34 seconds	100 knots
Class 2	Commuter aircraft (turboprops)	37%	37%	34 seconds	120 knots
Class 3	Large jets <300,000 lbs.	45%	49%	39 seconds	130 knots
Class 4	Heavy jets >300,000 lbs.	12%	11%	39 seconds	140 knots

Aircraft Separation. The in-trail separations varied depending on the sequence of aircraft types, the mix of arrivals and departures, and the weather conditions. The range of separations was from an average of 2.89 nautical miles, when a small aircraft was following a small aircraft under VFR 1, to 7 nautical miles, when a small aircraft was following a heavy aircraft in an IFR approach. The separations used were a combination of FAA standards and actual observations.

years, Massport has labored extensively to maintain a balanced view between aviation objectives and community concerns regarding noise, traffic, and redevelopment of the harbor area. While there are critics challenging the appropriate level of balance on both sides of the issue, it is clear that impacts to the community have become a major consideration in the deliberation of any decision affecting operation and development of the physical facilities at Logan. Any discussion to re-awaken the project to build Runway 14/32 has symbolic implications that exceed its potential physical impact on the neighboring community.

It needs to be stressed that this runway would only service smaller, non-jet aircraft. If the runway were restricted to unidirectional operations, there would be no increase in aircraft flying over nearby neighborhoods such as Jeffries Point. More importantly, the existing Runway 33L could then be used more often and more efficiently for air carrier aircraft.

8. The development of a second major airport is creating considerable opposition from candidate communities. They have raised legitimate challenges to demonstrate that every alternative, including enhancement of Logan's capacity, is being pursued to avoid such an impact.

APPENDIX B

Summary of Environ's Comments on the SDEIS/FEIR Air Quality Analysis for Logan Runway Expansion

Environ's Comments on SDEIS/FEIR Air Quality Analysis for The Logan Airside Improvements Planning Project Expansion
Preferred Alternative, May 31, 2001

Introduction

The March 2001 SDEIS/FEIR presents an air quality analysis that has two main conclusions. First, the analysis claims that air emissions benefits will be attained with the construction of the runway. This claim is based on theoretical mass-based air emission calculations and comparisons for two future emission scenarios that are projected for the year 2010/2015. Second, these calculations/comparison are then relied upon to make subsequent arguments that the proposed project is not regionally significant, not subject to federal conformity determinations, and is presumed to conform with state implementation plan requirements (See SDEIS/FEIR, March 2001, Page ES-24). As discussed in detail below, these conclusions are not adequately supported by the information set forth in the SDEIS/FEIR.

There are a number of assumptions that have been made in these analyses that favorably bias the air quality results and conclusions made in the SDEIS/FEIR relative to acceptance of the "Preferred Alternative." Many of these assumptions are simply not appropriate and result in misleading information that is often not presented in proper context.

The primary deficiencies noted are as follows:

1.0 Emission Inventories

The emissions inventories developed for the year 2010/2015 and presented in the SDEIS/FEIR Section 6.4.2 are based on the assumption of Peak Hour Pricing. The SDEIS/FEIR text does not indicate that Peak Hour Pricing is assumed in the analysis. However, the emissions contained in SDEIS/FEIR Tables 6.4-4 through Table 6.4-8 contain the same emissions values as the March 1997 Tables for Alternative 1 (which is indicated on the Tables to reflect emissions for the Runway, the Taxiway and Peak Hour Pricing). To our knowledge, no commitment to Peak Hour Pricing has been made for Logan Airport by Massport. Emissions without Peak Hour Pricing would be higher than those used in the SDEIS/FEIR. Therefore, the emissions differences between alternatives presented in this section of the SDEIS/FEIR cannot be determined based on the information presented. If, as it appears, the emissions estimates in Tables 6.4-4 through 6.4-8 are used in the dispersion modeling analyses, then the predicted impacts/concentrations also assume that Peak Hour Pricing is in place and the predicted impacts or concentrations in the SDEIS/FEIR for the construction of Runway 14/32 do not represent the Preferred Alternative as identified on Page 11 of the March 2001 Executive Summary (i.e., without Peak Hour Pricing).

2.0 Net Emissions

The main conclusion in the SDEIS/FEIR is that the "Preferred Alternative" would result in an emissions reduction relative to the "No Action Alternative." This is

based on the development and comparison of air emissions inventories (i.e., emissions of NOx, Nitrogen Oxides, Carbon monoxide, particulate matter and VOC's Volatile Organic Compound's). Each alternative is assumed to be capable of handling 37.5 million annual passengers. The "No Action Alternative" assumes that no changes will be made to the runway or existing plane configurations from the current Logan configuration. While the SDEIS/FEIR acknowledges that the current annual passenger demand is below 29 million passengers currently, the emissions calculations applied in the SDEIS/FEIR assume that the configuration will experience an increase in passenger throughput of 8.5 million passengers. This is the same passenger loading assumed for the "preferred alternative," which includes a new runway.

This is not a valid comparison for several reasons. First, improvements in actual ambient air quality can be only be demonstrated by comparing actual emissions and observed concentrations from the current time period to projected incremental impacts. The analysis presented in the SDEIS/FEIR compares a hypothetical future case (i.e., the Preferred Alternative) to another hypothetical future case (i.e., the No Action Alternative). This is an arbitrary analysis and the results could be different if the No Action Alternative was limited to the more likely case that a lower number of passengers could reasonably be expected to use the airport under the current configuration than under the "Preferred Alternative". The baseline alternative, although a future case, also did not provide for other mitigating actions for the existing configuration that are not necessarily related to runway expansions, such as increases in the number of gates.

3.0 Federal Conformity Determination and SIP Issues

The SDEIS/FEIR indicates that the project's emissions do not require a conformity determination. These are required for federal actions that have increases in VOC or NOx emissions that are greater than 50 ton per year in a non-attainment area or transport region (40 CFR 93.153(b)(1)). Boston and Logan airport are located in both a non-attainment area for ozone and a transport region and the increase in NOx emissions that are expected from future airport operations are greater than 50 tons per year. Therefore not only is Massport's conclusion of nonapplicability contrary to fact and regulations, but the projected increase in the "preferred alternative's" NOx emissions, from airport sources alone, from 1999 to 2010 is approximately 650 tons per year (See Table 6.4-5). The SDEIS/FEIR does not explicitly provide a basis for the non-applicability determination other than the comparison of two future alternatives. Furthermore, in order for emission reduction credits to be valid under State Implementation Plan (SIP) requirements, the emission reduction credits must be based on actual emission reductions. Anticipated or likely reductions due to future projections are not acceptable in meeting the reasonable further progress requirements for SIPs.

Related to this issue, the SDEIS/FEIR indicates that this action is not regionally significant and the action "presumes" compliance with the SIP. These statements are not objectively supported by the information provided in the SDEIS/FEIR.

Regionally significant is defined for federal actions in 40 CFR 93.152 as having an emissions potential of 10% or more for any non-attainment pollutant. The SDEIS/FEIR does not provide the details of the analysis used to indicate that this action is not regionally significant. However, the emissions inventory that is described in the SDEIS/FEIR indicates that emissions from airplanes are included up to a height of 3000 feet above the ground (See Page 6-96). This is an arbitrary assumption and is a default in the model that is used to calculate emissions. The meteorological information that is used in SIP modeling compliance analyses for Massachusetts simulates dispersion and ground level concentrations due to emissions from the surface up to what is referred to as a mixing height. The mixing height data for afternoon mixing heights is frequently on the order of several thousand meters (2000 m/6500 feet) and can be higher in some situations. Therefore, the emissions inventories presented in the SDEIS/FEIR are lower than would be expected if aircraft operations above 3000 feet were included in the development of air emissions inventories. Given the projected increase in demand included as a driver for the new runway, the emissions above 3000 feet could increase aircraft emissions estimates on the order of 150% more than Massport's calculations.

It is also important to note that the Massachusett's DEP considers Logan to be one of the largest NOx sources in the region. DEP also has formally acknowledged that the existing SIP for ozone will likely need modifications to provide for additional emissions reductions. Logan Airport is identified by DEP as one of the largest sources in the region, but one for which there are no required emissions reductions.[1] The SDEIS/FEIR contains no further commitment from Massport or for that matter any discussions whatsoever as to how Massport plans to reduce emissions or to implement economically based incentives that could be employed to reduce emissions.

It is also worth noting that DEP is requiring NOx emission reductions from power plants and these emissions can rise well above 3000 feet into the atmosphere. Nevertheless, these sources are regulated under the SIP and DEP air pollution control regulations. The main distinction between these sources is that power plants are stationary sources and traditionally these sources have been regulated to a larger degree than mobile sources under SIPs. Utility emissions, particularly emissions with a potential for long-range transport (e.g., above 3000 feet), were the topic of the recent US EPA SIP call on mid-western states and utilities to require NOx emissions controls. The EPA made the SIP call because transport of these emissions into other states was adversely affecting the air quality relative to ambient air quality standards in other states.

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[1] A letter dated April 22, 1999 from the DEP Northeast Regional Office to Secretary Bob Durand of the Executive Office of Environmental Affairs states "[a]irport and aircraft emissions represent the largest uncontrolled source of air pollution nationwide and in Massachusetts. In fact, aircraft emissions are the only mobile source of air pollution in the Massachusetts State Implementation Plan (SIP) emissions inventory that have not been controlled or slated for near- or long-term emissions reductions."

4.0 Revised Ambient Air Quality Standards

The SDEIS/FEIR acknowledges that the National Ambient Air Quality Standards (NAAQS) were recently revised by EPA for particulate matter and ozone. Specifically, the EPA revisions to the NAAQS were upheld by the Supreme Court in February of 2001. The result is that the ozone standard is now more stringent than the prior standard and there is a new standard that specifies acceptable ambient levels of PM with a diameter of 2.5 microns or less. The PM-2.5 NAAQS is targeted to respirable particulates that are small enough to avoid humans' natural air cleaning systems, enter the lungs and result in respiratory system problems.

The SDEIS/FEIR does not contain an evaluation of the project's PM 2.5 emissions or the baseline conditions that exist adjacent to the airport. Although it is a recent Supreme Court decision, the EPA promulgated the revised standards several years ago. The airport and the related sources could have an impact on the ambient air quality levels of PM-2.5. The SDEIS/FEIR states that "the revised standards are not immediately subject to implementation...." This is a misleading statement. As with any other NAAQS, the EPA and states must develop a plan to measure ambient air PM-2.5 levels, evaluate attainment status for appropriate control regions and develop state implementation plans (SIPs). Therefore, the DEP will likely need to revise the existing ozone SIP and develop a PM-2.5 maintenance plan or SIP. The SDEIS/FEIR does not evaluate the baseline conditions for the PM-2.5 NAAQS nor commit to any actual emission reductions from existing operations that will help bring the region into attainment with the ozone NAAQS.

The Massachusetts DEP has been collecting PM-2.5 data from four Boston locations since 1999. These data are publicly available, and identify several locations that are close to or exceed the PM-2.5 NAAQS in 1999 and 2000 (see Table 1). These data were available at the time of the SDEIS/FEIR, but were not incorporated and presented in the SDEIS/FEIR. Since the PM-2.5 data is close to the ambient standard (and exceeds at some of these locations), it could be difficult for the project to demonstrate that future impacts from airport related emissions would ensure that the PM-2.5 standard is maintained. The SDEIS/FEIR states that there are no predicted violations of any state or federal ambient air quality standards now or under future conditions (Page 6-122). However, the SDEIS/FEIR does not present or evaluate the DEP PM-2.5 monitoring data which indicates that monitoring locations in Boston are not currently in compliance the PM-2.5 NAAQS. PM-2.5 is an ambient air quality standard now, and the available data indicates that the SDEIS/FEIR statement referenced in the prior sentence has not considered baseline PM-2.5 measurements as required by the basic elements for an environmental baseline study. In addition, there is inadequate recognition of the fact that DEP considers the airport-related sources to be a major source of air emissions that will impact the region's ability to attain the ozone NAAQS.

TABLE 1 Summary of PM-2.5 Monitoring Data for Boston Area Locations					
Monitor Location	**Year**	**PM-2.5 Measurement (24-hour)**	**PM-2.5 NAAQS (24-hour)**	**PM-2.5 Measurement (annual)**	**PM-2.5 NAAQS (annual)**
Kenmore Square	1999	---	---	14.88 ug/m^3	15 ug/m^3
Charlestown	1999	---	---	15.42 ug/m^3	15 ug/m^3
Harrison Ave.	2000	65.9 ug/m^3 (11/27/00)	65 ug/m^3	---	---
	2001	63.9 ug/m^3 (1/23/01)	65 ug/m^3		
North St.	2000	---	---	15.92 ug/m^3	15 ug/m^3
Note: Data obtained from EPA's Aerometric Information Retrieval System (AIRS) data base.					

5.0 Long-range Transport and Class I Areas

The nature of airport emission sources, particularly aircraft, is that they emit pollutants at various altitudes throughout the air basin. The Logan expansion has the potential to impact - through long-range transport mechanisms - the air quality in downwind states and federally defined Class 1 Areas designed to preserve pristine air quality levels. The airport emissions, including NOx emissions, have the potential to impact air quality related values (40 CFR 52.21), such as visibility, in these Class 1 areas. The Maine coastline has several Class 1 Areas, defined in 40 CFR 81, that have experienced degradation of visibility from what is believed to be long-range transport from the northeast corridor. The SDEIS/FEIR fails to discuss or in any way address whether the proposed project will have an impact (positive or negative) on the Class 1 areas.

6.0 Hazardous Air Pollutants

The SDEIS/FEIR does not discuss or address the potential for HAP emissions from airport sources. The SDEIS/FEIR claims that air emissions are reduced, but the SDEIS/FEIR only quantifies emissions of four pollutants. The EPA and other groups throughout the country have acknowledged that airports are sources of HAPs and they are under consideration relative to the quantification of health risks and emission reduction strategies. These directives are mandated by the federal Clean Air Act, Title III, which among other requirements, required EPA to investigate exposures and strategies to control air pollutants from area sources in urban areas. The SDEIS/FEIR does not discuss whether the planned project is consistent with the progress of this development work or provide a status for the EPA's required study. Given the urban location of Logan Airport, this should be a relevant consideration in evaluating future expansions of the airport's operations.

7.0 Evaluation of Predicted Impacts from Aircraft Operations

The SDEIS/FEIR utilized dispersion modeling techniques to predict ambient air concentrations for certain NAAQS. However, these modeling evaluations were limited to a small portion of the region that could be impacted by airport operations. In particular, the modeling analyses presented in the SDEIS/FEIR

were not designed to resolve the maximum predicted concentrations for the NAAQS. Only the impacts at 12 specific receptor locations were evaluated. Therefore, these analyses do not necessarily demonstrate compliance with NAAQS in all the locations where the NAAQS are applicable (e.g., breathing zone locations that the public can access). In addition, while daily variations in airport activity are accounted for, the procedures utilized annual averages to represent daily activities. Therefore, the worst-case short-term scenarios were not simulated in the modeling and the predictions of ambient air concentrations are not necessarily protective of the short-term NAAQS for all ambient air locations. Since the NAAQS include short-term standards (e.g., 1-hour, 3-hour and 24-hour averages), the modeling analyses are not consistent with procedures routinely applied and required by SIPs to demonstrate compliance with NAAQS.

In addition, the modeling techniques did not evaluate the potential for air emissions which are emitted into a stable atmospheric level aloft to be brought down to the surface during inversion break-up conditions. Given the fact that this is a coastal environment with landing operations over the water and adjacent to residential areas, thermal inversion breakup conditions have the potential to create short-term peaks for ground-level pollutant concentrations. In addition, these analyses are also limited by the use of emissions data that does not contain aircraft emissions for heights above 3000 feet.

Summary

The SDEIS/FEIR has the following flaws and inadequacies:

- The SDEIS/FEIR fails to objectively present the air emissions inventory or air quality for the Preferred Alternative defined in the March 2001 SDEIS/FEIR
- Air emission comparisons are presented in a misleading manner based on a future to future analysis that arbitrarily indicates a reduction in air emissions
- Aircraft air emissions inventories are underestimated, possibly on the order of 150% for some pollutants.
- The Project does not include a SIP conformity determination, even though DEP considers the Airport one of the Major NOx sources in the region and the Air Quality Control Region is designated as a serious ozone nonattainment area.
- The SDEIS/FEIR fails to include such material facts as actual PM-2.5 monitoring data and project related PM-2.5 emissions
- The SDEIS/FEIR fails to consider Long-Range Transport and Class I Areas
- The SDEIS/FEIR fails to discuss or address the potential for HAP emissions.

APPENDIX C

Assessment of Airport Noise Monitoring at Hull, MA, Paul Schomer (May 31, 2001)

SCHOMER AND ASSOCIATES

ASSESSMENT OF AIRPORT NOISE MONITORING AT HULL, MA

May 31, 2001

Paul Schomer

Schomer and Associates

Champaign, IL 61821

ASSESSMENT OF AIRPORT NOISE MONITORING AT HULL, MA

May 31, 2001

I. INTRODUCTION

1. Background

The Massachusetts Port Authority (Massport) operates Boston's Logan Airport (Logan). As part of this operation they have created a noise office. One of the functions of this noise office is to operate a large set of noise monitors that are distributed throughout the vicinity of Logan. One of these monitors is located by the high school in Hull and about 67 ft from the water's edge.[1] Figure 1 shows the position of the high school in Hull and Figure 2 is a picture of the monitor looking towards the school.

The microphone of a noise monitor "hears" all the noise that is present at a site. In general, this includes both airport noise and non-airport noise. Non-airport noise generally includes all noise except for noise from aircraft arriving to or departing from the airport. In general, this includes traffic, industrial and neighborhood noise. Non-airport noise can even include transient aircraft that are not arriving from or departing to the airport. One non-airport noise can be the pseudo-noise generated by wind and another, at this site, can be wave noise.

Separating the desired noise from all other noise in an unattended monitoring situation is always a challenge and a tradeoff. One can be very "conservative" and establish criteria such that little or no non-airport noise is included in the airport total. However, the result of a very "conservative" strategy is to systematically exclude some airport noise. On the other hand, one can be very "liberal" and include all or nearly all noise. The "liberal" strategy insures that all airport noise is included in the total. However, the "liberal" strategy systematically includes some non-airport noise. Like in any decision theory, the optimum point is where the systematic errors cancel. Such an optimum point will include some non-airport noise in the total. But it will also fail to include some airport noise. Ideally, these biases will cancel. Some, such as Schomer *et al.* (2001), have developed expert systems to accomplish this task.

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[1] Including a 5 ft high, 2.5 ft wide seawall

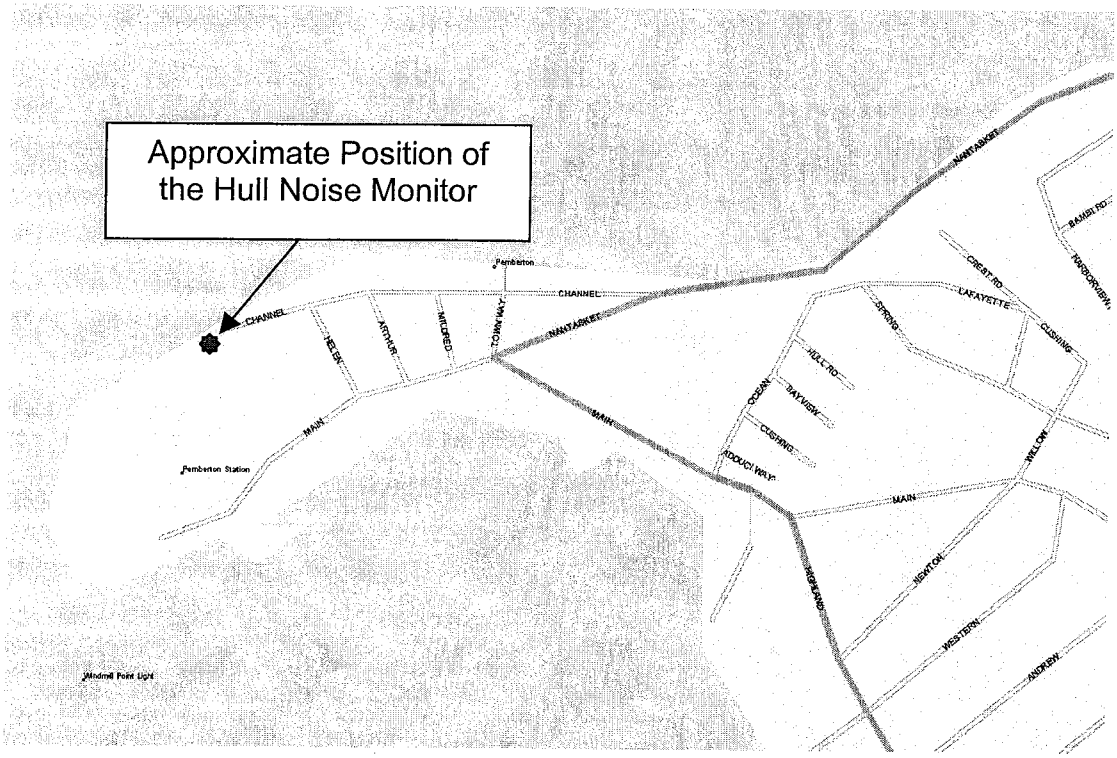

Figure 1. Approximate position of the Logan noise monitor at the tip of the Hull peninsula

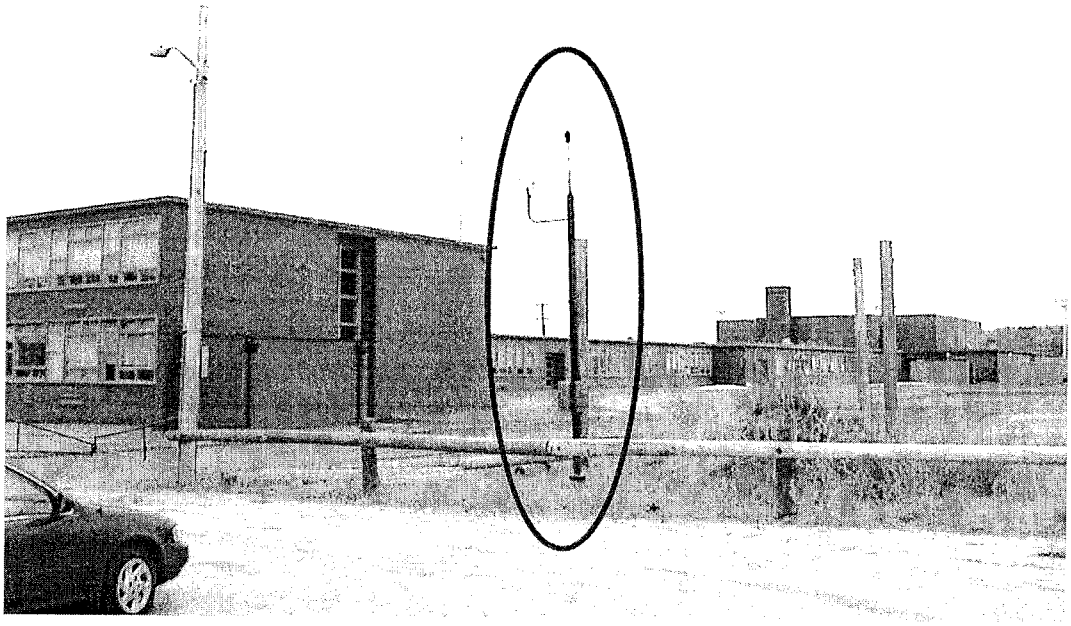

Figure 2. The Hull noise monitor looking towards the high school

With respect to the monitor at Hull, it is acoustically well situated. It is far from busy roadways, industrial noise sources, and other sources of acoustical noise. However, this monitor can be subject to wind induced noise or wave noise.

The noise office at Logan has developed methods to separate "just airport noise" from the total noise measured by their monitors. Typically, at Hull, this method results in airport only noise levels that are about 4 dB less than the total noise level measured by the monitor. Nearly all of the excess noise is attributed to wind noise and wave noise. The noise office at Logan indicates that their method, especially at night, is to search for hours when the L90 (the sound level exceeded 90 percent of the time) exceeds 55 dB. This level, 55 dB, is chosen because the monitor at Hull is set to include events such that the maximum level exceeds 65 dB. The noise office removes the hourly LEQ data from the calculation for those hours for which the L90 exceeds 55 dB. In addition, if the L90 for one-quarter of the total day (some combination of 2 nighttime hours and/or 4 daytime hours) exceeds 55 dB then the hourly LEQ data for the entire day are removed.

2. Purpose

The purpose of this paper is to examine the efficacy of the Logan noise office strategy. The Logan noise office has been kind enough to supply a sampling of data from the Hull monitor along with ancillary data. They have supplied the monitor data for every twelfth day throughout a year. Every twelfth day was chosen so that all days of the week would be equally sampled and so that the sampling would span short-term weather fronts. The noise monitor data include single events and hourly equivalent levels (LEQ). The single events are such that the maximum level exceeds 65 dB and the duration exceeds 10 seconds. The hourly data also include the L1, L10, and L90 levels. The monitor data also include information on wind speed and wind direction at the monitor. The ancillary data include weather observations at the airport throughout the day, and each change in runway configuration.

II. SINGLE EVENT DATA

Table 1 contains the DNL calculated for each sampled day based on the single-event data and on the hourly LEQ data. Obviously, some days contribute much more than others to the total noise. For purposes of brevity and simplification, this analysis concentrates only on the louder days, the days shown in bold in Table 1. The days considered are such that the DNL attributable to the single events exceeds about 58 DNL, a value that is 5 dB below the energy average for the entire sampling period. Days for which the DNL is less than 58 dB contribute little to this energy average of 62.9 dB.

As examples, Annex A contains the single-event data for the first 3 bolded days delineated above, for December 15 and for February 5. Each table in Annex A contains the changes in runway configuration, the airport weather observations and the single-event data measured at the Hull monitor—all in chronological order for a single day. Runway configurations that include landings on Runway 33L are designated "landing" configurations with respect to Hull. Runway configurations that include takeoffs on Runway 22L or 22R are designated "takeoff" configurations. Occasionally, "both" takeoffs (Runway 22L and 22R) and landings (Runway 33L) are present at the same time. Even less frequently, neither landings nor takeoffs are active in the direction of Hull when single events are registered on the Hull monitor. Table 2 contains the summary data for single events on the "loud" days registered at the Hull monitor. For each day, this table contains the number of events registered during landing conditions (Runway 33L active for landings), the number registered during takeoff conditions (Runway 22L and/or 22R active for takeoffs), the number registered during "both" conditions (Runway 33L active for landings and Runway 22L and/or 22R active for takeoffs), and the number registered during "other" conditions (neither takeoffs nor landings active over Hull).

The data in Table 2 can be used to infer wind effects. If there are significant wind-only data then there should be many single events when neither landings nor takeoffs were active over Hull—the "other" condition. But this is not the case. With the exception of February 5, there are only 16 "other" events out of over 3000 events. This fact alone indicates that except for February 5, the Hull monitor only registered single events when aircraft were active over Hull. Therefore, all of the single-event data, except for some of the data on February 5, are attributable, at least in part, to airport operations.

Day	DNL Based on Single-Event Data	DNL Based on Hourly LEQ Data
6-Apr-00	**61.1**	**65**
18-Apr-00	45.1	63.7
30-Apr-00	56.2	61.6
12-May-00	**61.8**	**64.1**
24-May-00	40.7	59
5-Jun-00	54	60.1
17-Jun-00	**61.2**	**63.8**
29-Jun-00	**59.6**	**61.8**
23-Jul-00	56.9	60.7
4-Aug-00	56.6	59.2
16-Aug-00	**61.3**	**63.6**
28-Aug-00	56.2	60
10-Sep-00	52.9	59
22-Sep-00	**63.4**	**65.6**
4-Oct-00	**61.7**	**64.4**
16-Oct-00	50.2	62.6
28-Oct-00	69.9	
9-Nov-00	56.5	61.8
21-Nov-00	**62**	**65.7**
3-Dec-00	55.8	63.4
15-Dec-00	**62.3**	**67.2**
27-Dec-00	**65.5**	**69.9**
12-Jan-01	56.5	61.2
24-Jan-01	**59.8**	**62.3**
5-Feb-01	**72.7**	**73**
17-Feb-01	**70.6**	**71.3**
1-Mar-01	57.7	62
13-Mar-01	**59.2**	**62.8**
25-Mar-01	**60.9**	**64.9**
Energy Average	**62.9**	**65.3**

Table 1. Daily DNL data measured by the Hull noise monitor based on single-event and hourly data as indicated. The bold indicates the louder single-event days. These were selected for further analysis.

The duration of the single-event noise blocks and the shear number of blocks can also be used to infer wind effects. February 5 is already noted as windy by the above test. This day also exhibits many single-event noise blocks where the duration of some blocks is minutes or even 10s of minutes long. Aircraft do not create long noise blocks; aircraft noise blocks are only 10 to 40 or 45 seconds long. So hours containing long-duration noise blocks include wind or other non-aircraft noise. In addition to February 5, February 17 contains several to many long-duration blocks during some hours of the day, and December 27 contains a very few long-duration blocks. No other day has long-duration single-event noise blocks as a part of its data.

Number of events also can be an indicator of wind or other non-airport noise. The February 17 data include 802 single events and the December 27 data include 567 single events. These numbers of events are on the high side—they indicate the presence of wind or other non-airport noise. (February 5 does not have such a large number of events only because it has so many long-duration events.) None of the other days listed in Table 2 exhibits an abnormally large number of single events.

Day	Landings	Both	Takeoffs	Other	TOTAL
6-Apr-00	7	10	108	2	127
12-May-00	49	0	72	1	122
17-Jun-00	165	0	57	0	222
29-Jun-00	0	0	35	3	38
16-Aug-00	21	0	102	4	127
22-Sep-00	136	22	106	0	264
4-Oct-00	179	0	38	0	217
21-Nov-00	0	9	179	0	188
15-Dec-00	64	0	7	5	76
27-Dec-00	562	0	0	0	562
24-Jan-01	102	0	16	0	118
5-Feb-01	13	0	0	303	316
17-Feb-01	802	0	0	0	802
13-Mar-01	0	0	13	1	14
25-Mar-01	117	18	41	0	176
Totals excluding February 5	**2204**	**59**	**774**	**16**	**3053**

Table 2. This table shows the number of events registered during landing conditions (Runway 33L active for landings), the number registered during takeoff conditions (Runway 22L and/or 22R active for takeoffs), the number registered during "both" conditions (Runway 33L active for landings and Runway 22L and/or 22R active for takeoffs), and the number registered during "other" conditions (neither takeoffs nor landings active over Hull).

III. HOURLY LEQ DATA

The Hull noise monitor hourly data include the various acoustical measures cited above along with the average wind speed. Figures 3, 4, 5, and 6 plot the hourly LEQ versus hourly average wind speed for LEQ, L1, L10, and L90 data, respectively. Each of these figures contains two regions. In each figure, at lower wind speeds, the levels are independent of wind speed, and at higher wind speeds, the average levels increase with wind speed. The region in each figure where the levels increase with wind speed are being affected by wind noise. This wind effect is significant only when the level begins to exceed the levels at low wind speeds by more than a decibel or two. That is, for example, if 64 dB occurs at low wind speeds, then 64 dB cannot be eliminated just because the wind is higher. In Fig. 3, this wind criterion is met when the LEQ exceeds 64.5 dB; in Figure 4, when the L1 exceeds 76.5 dB; in Figure 5, when the L10 exceeds 67.5 dB, and in Figure 6, when the L90 exceeds 56.5 dB.

One can test the consistency of these 4 wind criterion levels by plotting the data against each other. Figures 7, 8 and 9 contain the hourly L1, L10 and L90 data plotted versus the hourly LEQ data. Each of these 3 figures contains a "cloud" of valid data and a "straight line" region where wind noise appears to dominate. In Figure 7, the "cloud" ends when L1 exceeds 76.5 and LEQ exceeds 64.5 dB. In Figure 8, the "cloud" ends when L10 exceeds 67.5 and LEQ exceeds 64.5 dB. In Figure 9, the "cloud" ends when L90 exceeds 58 dB and LEQ exceeds 64.5 dB. The numbers generated by Figures 7, 8, and 9 are completely consistent with the numbers generated by Figures 3, 4, and 5. The only discrepancy is with Figure 6. Figure 6 suggests a criterion value for L90 of 56.5 dB while Figure 9 suggests a criterion value for L90 of 58 dB.

Actually, this inconsistency may be irrelevant. The DNL for aircraft dominated noise should be rather insensitive to minor changes in L90. It would appear that the "wind" criterion should be based on LEQ since this criterion level of 64.5 dB correlates well with each of the other criterion and since the DNL is definitely sensitive to the LEQ. It is suggested that a proper wind criterion is an hourly LEQ of 64.5 dB. When the hourly LEQ exceeds 64 dB, then the levels are, at least in part, corrupted by wind noise. However, normally, at least some of the noise is aircraft noise. Therefore, it seems reasonable to replace each hourly LEQ that exceeds 64 dB by a level of 55 dB. This includes a small fraction of the sound energy that should be attributable to aircraft noise while excluding a large fraction of the sound energy that should be attributable to wind or wave noise.

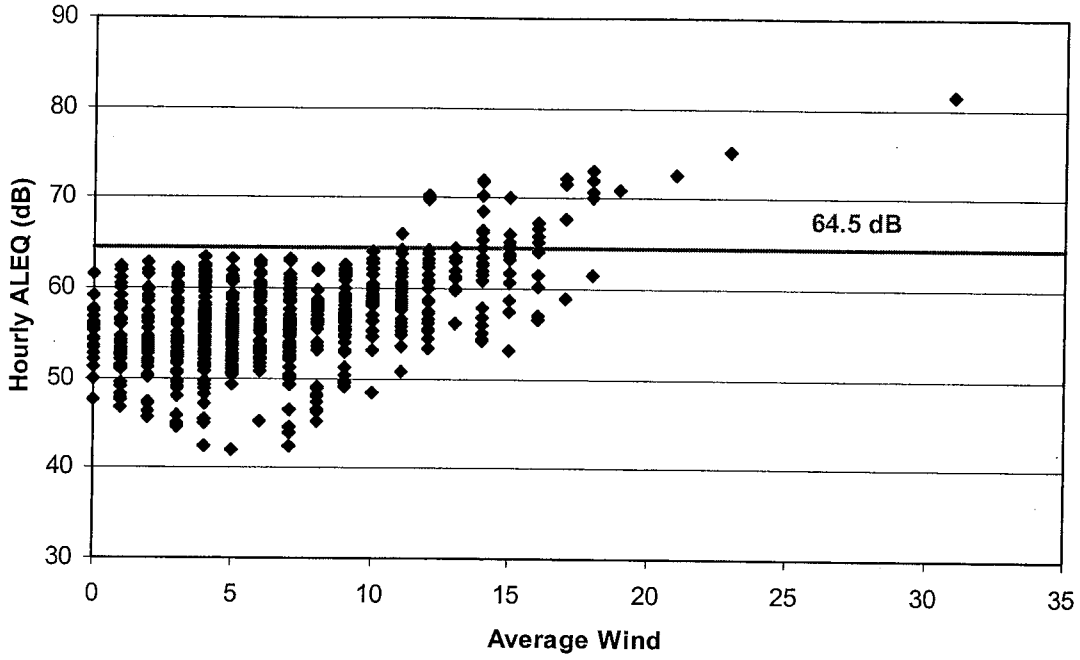

Figure 3. Hourly ALEQ versus average hourly wind speed

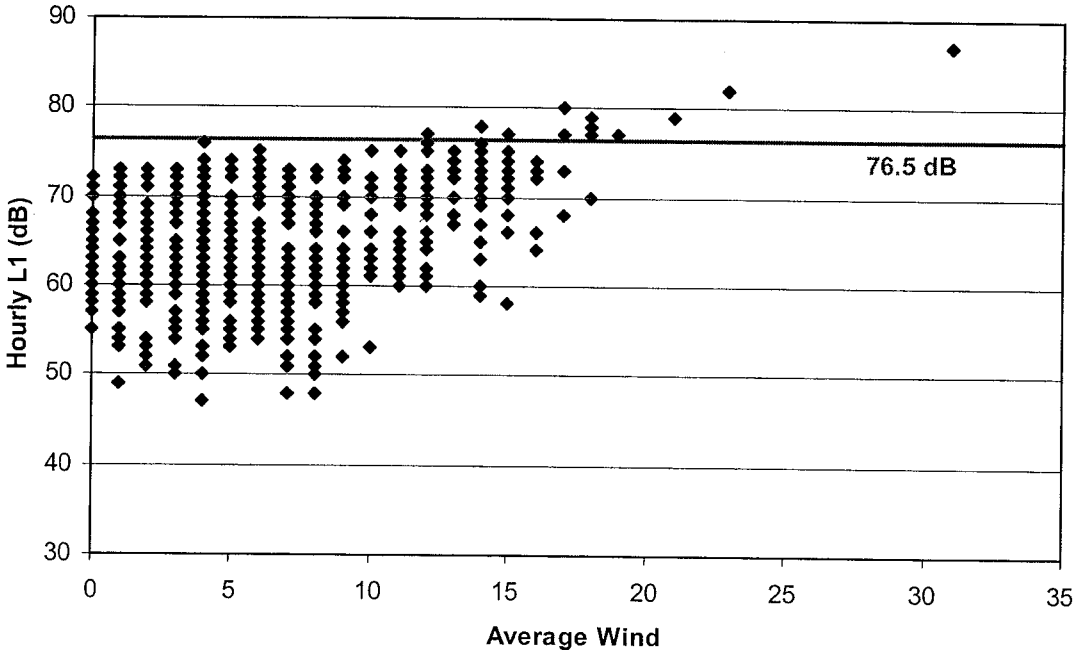

Figure 4. Hourly L1 versus hourly average wind speed

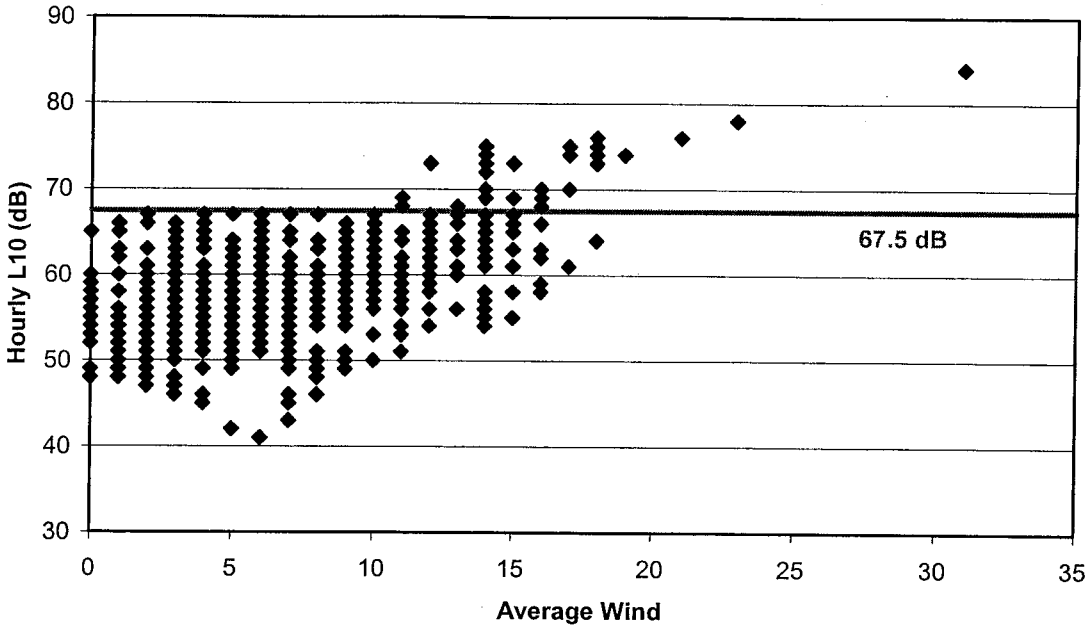

Figure 5. Hourly L10 versus hourly average wind speed

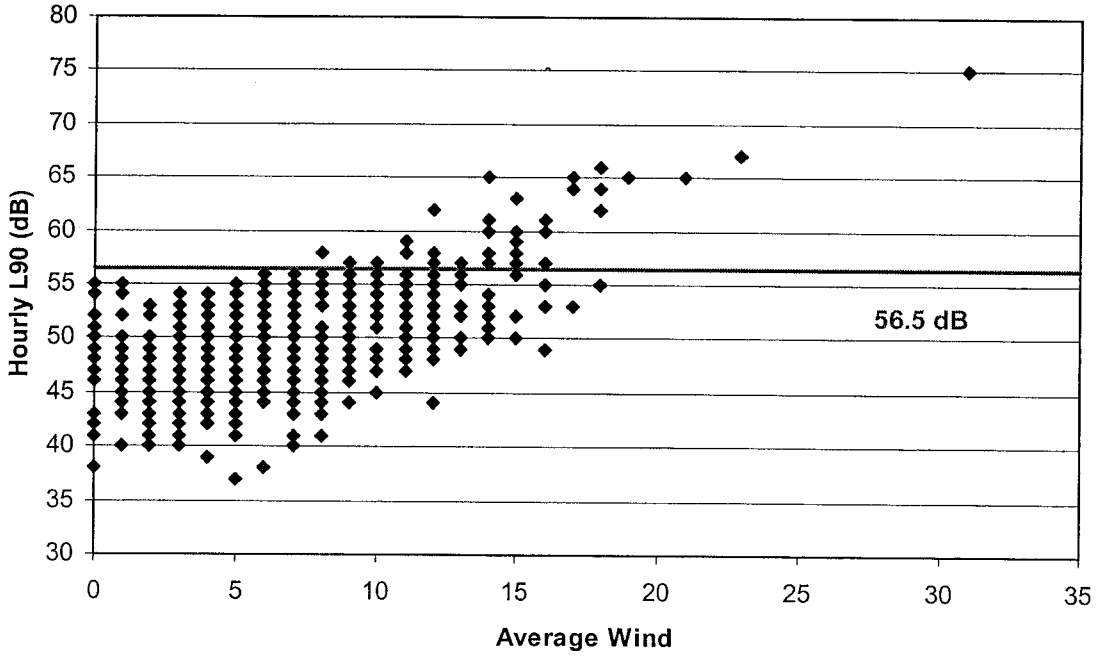

Figure 6. Hourly L90 versus hourly average wind speed

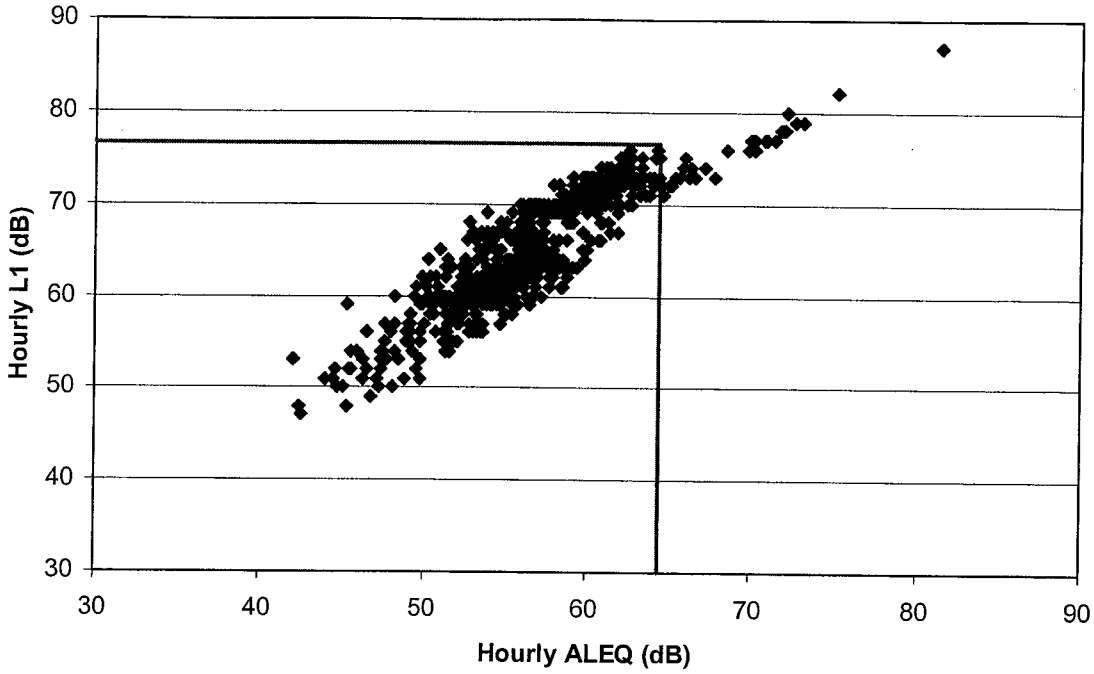

Figure 7. Hourly L1 versus Hourly ALEQ

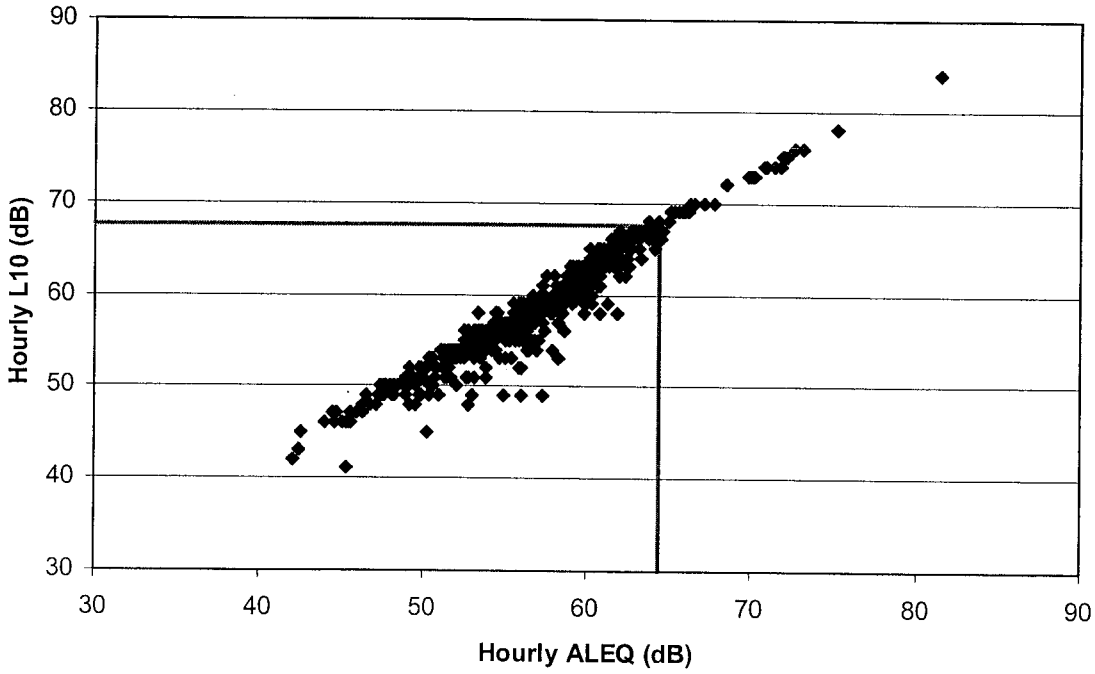

Figure 8. Hourly L10 versus Hourly ALEQ

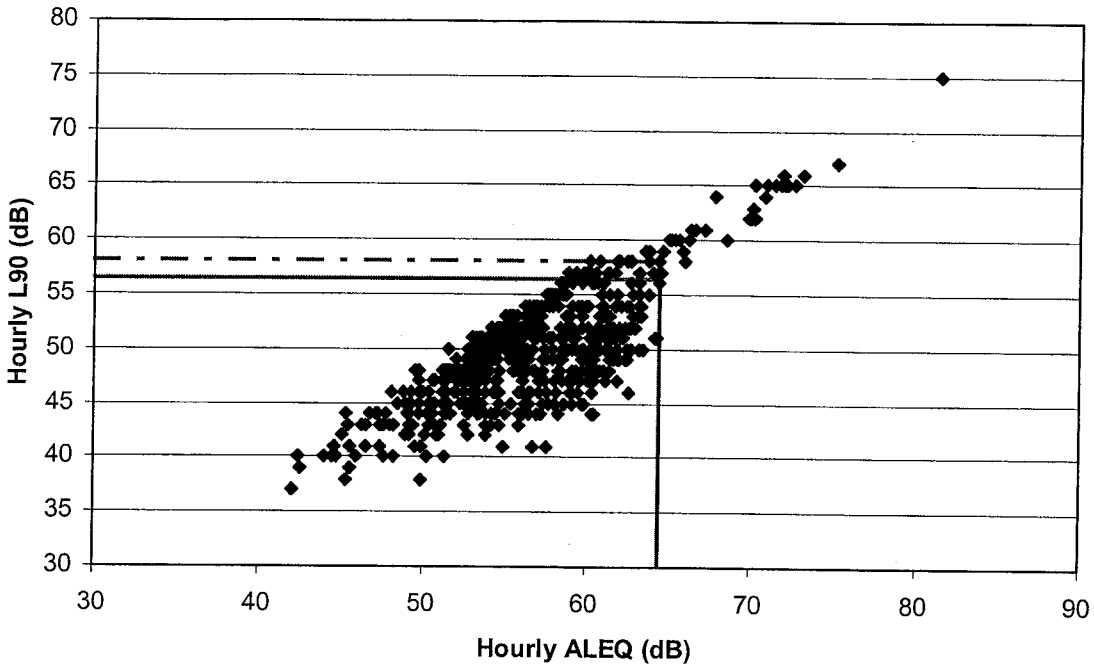

Figure 9. Hourly L90 versus hourly ALEQ

IV. DISCUSSION

In section II, the single-event noise data from February 5 were identified as very wind-corrupted data, the single-event noise data from February 17 were identified as wind-corrupted data, and the single-event noise data from December 27 were identified as a little wind-corrupted data. If one applies the 64-dB LEQ test to the hourly data for these three days, then all of windy hours on these three days are removed. This simple validation shows the reasonableness of this 64-dB ALEQ screen to determine and delete wind-corrupted data from the Hull monitor.

Table 3 compares the daily DNL calculated from the hourly data using:

(a) no screen

(b) Logan screen

Step 1. Elimination of any data such that the hourly L90 exceeds 55 dB

Step 2. Elimination of whole days when more than 1/4 of the "day" L90 exceed 55 dB

(c) elimination of any data such that the hourly LEQ exceeds 64 dB

This table also includes the energy average DNL for the entire ensemble of sample days. Results using the Logan screen (Steps 1 and 2) are shown in the third column of Table 3. Days eliminated by the "1/4 of the day" test are shown in red italics. The results show that February 5, the very windy day, is almost totally removed by all screening techniques.

If one uses only an hourly 55-dB L90 screen without deleting any whole days (Logan Step 1), then the ensemble result (Table 3) is 62.1 dB. Also, considering only the 55-dB L90 screen compared with the 64-dB LEQ screen (without deleting whole days), February 17 is dropped by about 10 to 12 dB by either screening technique but, as expected, the 64 dB ALEQ screen attenuates less than does the 55-dB L90 screen. December 27, the "slightly" windy day, is attenuated much less when using the 64-dB ALEQ screen than if one uses a 55-dB screen. This is as it should be. The December 27 data were only slightly windy and so the data for this day should be reduced only a little.

Historically, the 55-dB L90 screen (with deleting whole days—Logan Steps 1 and 2) has shown the airport only noise at Hull to be about 4 dB less than the total noise. This sample (Table 3) shows the 55-dB L90 screen value of 61.3 dB to be exactly 4 dB less than the total noise—exactly the historical value. In contrast, the 64-dB ALEQ screen is 2 dB less than the total noise. From the result using the 64-dB ALEQ screen, one can conclude that the aircraft only DNL at the Hull site is 2 dB less than the total measured DNL.

As yet one more test, if the hourly only 55-dB L90 screen (no deletion of whole days) is changed to 58-dB, the value one can infer from Figure 9, then 64-dB ALEQ screen and the 58-dB L90 screen yield virtually identical results of 63.2 dB.

Date	No Screen	55 dB L90 Screen	64 dB ALEQ Screen
6-Apr-00	65.0	65.0	65.0
18-Apr-00	63.7	*59.3*	63.7
30-Apr-00	61.6	61.6	61.6
12-May-00	64.1	64.1	64.1
24-May-00	59.0	59.0	59.0
5-Jun-00	60.1	59.9	60.1
17-Jun-00	63.8	63.5	63.5
29-Jun-00	61.8	61.8	61.8
11-Jul-00	0.0	0.0	0.0
23-Jul-00	60.7	60.7	60.7
4-Aug-00	59.2	59.2	59.2
16-Aug-00	63.6	63.6	63.6
28-Aug-00	60.0	60.0	60.0
10-Sep-00	59.0	59.0	59.0
22-Sep-00	65.6	65.6	65.5
4-Oct-00	64.4	64.4	64.4
16-Oct-00	62.6	61.8	62.6
28-Oct-00	0.0	0.0	0.0
9-Nov-00	61.8	61.8	61.8
21-Nov-00	65.7	*63.5*	65.5
3-Dec-00	63.4	*62.0*	63.4
15-Dec-00	67.2	*60.7*	66.3
27-Dec-00	69.9	*55.3*	67.1
12-Jan-01	61.2	61.2	61.2
24-Jan-01	62.3	62.3	62.3
5-Feb-01	73.0	*57.0*	59.7
17-Feb-01	71.3	*60.2*	62.1
1-Mar-01	62.0	62.0	62.0
13-Mar-01	62.8	62.8	62.8
25-Mar-01	64.9	64.2	64.9
Energy Average	**65.3**	**62.1(*61.3*)**	**63.2**

Table 3. Daily DNL (computed from hourly LEQ) and ensemble energy average DNL for the indicated wind screening technique. Days deleted using the L90 screen are shown in italics in red. The ensemble sum before deleting whole days is 62.1 dB for the 55-dB screen. With whole days deleted (red, italics), the ensemble sum drops to 61.3 dB.

V. CONCLUSIONS

Based on this sample, wind and/or wave noise seriously effects less than 10 percent of the sample days.

The present 55-dB L90 screen used by Logan seems to be a little too conservative. An L-90 level of 55 dB does not significantly affect the louder aircraft noise hours at the Hull monitor.

Hourly ALEQ of 64.5 dB or less regularly occurs at the Hull monitor in low wind conditions. Therefore, a screen using 64 dB ALEQ will not eliminate or alter non-windy data, but it will correct windy data.

Replacing each hourly ALEQ that exceeds 64 dB by 55 dB appear to correct for and remove the effects of wind and wave noise at the Hull monitor.

Using this 64-dB ALEQ screen, the aircraft only DNL is about 2 dB less than the total measured DNL at the Hull monitor.

REFERENCES

Schomer, Paul D., Matthew Bandy, Jeffrey Lamb, and Hans van Slooten, **(2000)**. "Using fuzzy logic to validate blast noise monitor data," *Noise Control Engineering Journal*, **48**(6), 193-205, Nov-Dec 2000.

ANNEX A. Example Daily Single Event Data Along With Winds and Runway Usage

Date	Page
April 6	17
May 12	21
June 17	25
December 15	31
February 5	34

Apr 6 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
0:00:00						270	14	24		
0:00:00	33L	33R	27	33L						
0:00:37									71.3	83.7
0:03:49									73.3	83.7
0:06:17									68.6	78.7
0:14:19									68.9	78.4
0:21:53									76.8	84.2
0:24:35									70.6	78
0:28:25									72.3	83.3
0:55:00	33L	33R	22R	22L						
0:57:40									70.8	81.4
1:00:00						270	19			
1:04:58									74.1	82.8
1:33:01									70.1	79.1
1:36:31									72.9	82.7
2:00:00						260	15	21		
2:13:01									77.3	85.4
2:52:05									71.3	80.1
3:00:00						250	15			
3:58:38									67.8	77.2
4:00:00						250	13	24		
4:08:40									73.1	81.6
4:15:17									76.6	86.8
5:00:00						240	13			
5:23:31									68.9	76.9
5:30:00	27	22L	22R	22L						
5:58:45									75.5	85
6:00:00						240	12			
6:06:57									74.7	85
6:13:05									74.7	84.5
6:16:34									72.7	82.7
6:26:16									70.9	79.1
6:37:51									74.7	85
6:39:15									75.5	85.9
6:41:30									78.2	86.9
6:51:36									74.8	85.4
6:52:35									71.1	79.1
6:53:19									74.1	83.4
6:54:31									70.8	80
6:56:32									73.1	83
6:57:43									72.7	82.2
7:00:00						230	12			
7:00:00						230	12			
7:09:12									69.3	78.4
7:22:09									76.8	88
7:27:21									77.6	84.6
7:33:26									74.9	85.6

Apr 6 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
7:39:42									75.4	84.4
7:42:04									69.1	77.1
7:42:19									73.2	83.4
7:46:11									76.2	86.2
7:51:30									70.9	82.3
7:52:58									75.1	85
7:56:27									72	79.6
7:57:19									72.9	83.8
8:00:00						230	12			
8:00:00						230	12			
8:00:00						230	12			
8:13:57									76.4	84.1
8:27:40									71.3	81.6
8:28:43									70.5	79
8:31:18									81	90.3
8:33:21									71.3	79.9
8:39:21									75	84.7
8:48:04									71.9	79.9
8:48:47									72.1	80.1
9:00:00						240	11			
9:00:00						240	11			
9:00:00						240	11			
9:11:34									73.3	81.2
9:15:37									75.6	85.5
9:16:56									75.7	87.7
9:20:00	22L	22R	22R	22L						
9:25:57									74.6	84.5
10:00:00						230	12			
10:00:00						230	12			
10:00:00						230	12			
10:30:00	27	22L	22R	22L						
10:48:14									73.3	83.5
10:48:59									69.6	77.1
10:53:22									74.5	85.6
11:00:00						230	10			
11:00:00						230	10			
11:00:00						230	10			
11:05:59									69.6	78.8
11:08:29									70.3	78.9
11:13:09									75	85.1
11:28:01									70	79.9
11:33:13									71	80.6
11:35:07									72.1	79.7
11:42:01									71.2	78.6
11:44:09									70.2	80
11:51:07									69.7	78.7

Apr 6 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
11:53:07									71.1	80.6
12:00:00						220	12			
12:00:00						220	12			
12:00:00						220	12			
12:04:25									71.4	80.9
12:25:16									72	82.7
12:31:19									69.5	77.8
12:47:58									74.5	82.7
13:00:00						200	4			
13:00:00						200	4			
13:00:00						200	4			
13:41:20									75.7	84.2
14:00:00						180	11			
14:00:00						180	11			
14:00:00						180	11			
14:06:30									80.4	89.4
14:28:32									73	79.5
14:44:53									71.6	79.9
14:49:51									71.8	81
15:00:00						180	13			
15:00:00						180	13			
15:00:00						180	13			
15:01:28									73.8	80.3
15:09:49									70.5	78.9
15:15:18									72.2	80.7
15:20:45									74.3	83.8
15:41:47									72.1	78.3
15:46:23									74.5	85.4
15:54:16									77	88.8
15:55:35									74.3	83
15:57:56									74	82
16:00:00						210	10			
16:00:00						210	10			
16:00:00						210	10			
16:04:30									73.2	82.4
16:05:11									72.1	79.3
16:07:17									73.8	81.9
16:14:51									79.7	89.5
16:19:15									73.6	82.8
16:21:11									73	82.3
16:23:47									71.8	78.6
16:26:12									76.4	85.2
16:29:29									73.8	82.6
16:51:02									71.1	80.3
16:54:16									74.7	85.8
16:57:53									72.3	82.7

Apr 6 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
17:00:00						230	3			
17:00:00						230	3			
17:00:00						230	3			
17:06:31									72.7	81.5
17:15:51									69.4	79.1
17:16:16									76	86.2
17:19:49									70.1	80.7
17:21:51									70.7	79.1
17:34:58									73.6	82.4
17:36:16									70.1	81.3
17:48:46									76.5	85.9
17:51:35									71.7	82.2
17:59:29									72.2	80.1
18:00:00						120	6			
18:00:00						120	6			
18:00:00						120	6			
18:01:20									69.4	77.9
18:10:09									77.7	89.1
18:14:09									74.6	85.4
18:14:57									71	82.8
18:18:53									75.4	84.6
18:19:55									76.4	86
18:21:37									72.3	83.5
18:25:00	4R	4L	9	4R	4L					
18:25:34									73.9	83.1
19:00:00						50	5			
19:00:00						50	5			
19:00:00						50	5			
19:52:21									68.1	77.2
20:00:00						20	10			
20:00:00						20	10			
21:00:00						340	11			
21:00:00						340	11			
22:00:00						300	3			
22:00:00						300	3			
22:00:00	27	22L	22R	22L						
22:14:19									73.2	82.8
22:23:52									70.2	79.4
22:28:19									71.9	82.5
22:30:43									74.7	84.3
22:32:24									73	83.5
22:38:28									79.5	90.1
22:43:04									69.3	77.7
22:47:42									71.9	81.5
23:00:00						200	6			
23:28:21									76.8	84.7
23:31:26									74.9	85.9

May 12 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
0:00:00						330	6			
0:00:00	4R	4L	15R							
0:35:00	33L		15R							
0:49:43									72.7	84.7
0:52:51									71.3	82
0:54:53									71.6	82.9
0:56:18									70.2	80.8
1:00:00						280	6			
1:00:23									70.5	81.1
1:13:29									70.2	81.1
1:20:19									70.2	80.3
1:26:15									79.7	90
1:45:39									69.6	80
1:55:33									70	77.9
2:00:00						280	7			
2:04:19									73.2	84.4
2:51:17									69.9	80.6
3:00:00						290	6			
4:00:00						290	8			
4:34:51									74	85
4:37:09									77.4	86.9
4:56:03									71.4	81.3
5:00:00						290	7			
5:42:08									74.2	83.3
5:44:02									74.1	84.5
5:45:00	27	22L	22R	22L						
5:48:33									71.7	81.4
5:51:28									73.8	83.8
6:00:00						280	6			
6:03:03									72.4	80.6
6:17:21									73.8	84.5
6:19:14									80.5	90.6
6:24:56									72.4	82.7
6:27:40									67.6	77.8
6:32:43									71.3	82
6:40:00									67.5	76.7
6:45:49									67.6	76.7
6:49:24									71.6	81.2
6:51:57									72.3	83.1
6:54:51									78.9	87.9
6:56:13									70.5	81.6
7:00:00						300	8			
7:13:49									71.4	82.9
7:16:30									70.4	81.4
7:22:20									79.9	90.8
7:26:46									70.5	79.3
7:30:46									70	79.9

May 12 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
7:37:08									71.8	83.8
7:41:35									76.5	87.5
7:42:50									68.2	81.4
7:43:40									71.9	82.4
7:47:00	33L	33R	27	33L						
7:49:30									74.1	84.2
7:51:00									68.4	77
7:53:38									68.6	77.3
7:55:05									73.2	84.2
7:56:10									68.2	78.7
7:59:59									67	76.5
8:00:00						300	6			
8:05:00									68.9	78.4
8:06:30									71.5	79.7
8:07:54									73.4	83
8:12:17									74.7	84.2
8:13:37									80	88
8:15:23									76.4	86.5
8:20:46									74.5	84.2
8:22:14									74.7	84.1
8:26:39									70.6	81.5
8:28:09									73.5	83.3
8:39:10									72.4	82.5
8:44:00									70.2	80.8
8:49:58									74.3	85.6
8:52:58									71.2	82
8:54:39									68.9	78
8:57:45									71.9	81.2
9:00:00						0	5			
9:04:34									71.6	81.8
9:08:49									73.4	83.5
9:10:31									74	84.4
9:15:51									76.3	86.8
9:17:38									68.3	77.9
9:19:12									71.5	82.2
9:20:43									73.3	84.9
9:22:34									71.2	82.5
9:27:52									71.3	81.6
9:31:24									76.7	87.1
9:35:00	4R	4L	4R	4L						
10:00:00						130	7			
10:00:00						130	7			
10:45:00	4R	4L	9	4R	4L					
15:55:35									70.4	81.1
16:10:00	27	22L	22R	22L						
16:31:18									68.4	77.3
16:36:14									75	83.7

May 12 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
16:46:18									73.9	84.2
16:47:07									68.6	77.3
16:58:18									73	84.7
17:09:36									68.6	78.9
17:16:45									81.9	91.2
17:41:58									77.1	87.5
17:42:47									74.2	85.1
18:09:47									73.2	83.9
18:18:56									81.7	91.8
18:23:55									74.9	85.3
18:24:29									69.9	80.2
18:34:51									76.7	86.1
18:38:14									72.2	82.3
18:39:35									72.4	80.9
18:40:40									75.5	85.7
18:43:27									76	86.1
19:00:29									70.9	83.1
19:02:05									74.4	85.5
19:15:58									71.1	81.2
19:20:40									70.2	80.2
19:21:44									70.9	82.1
19:32:23									74.9	84.2
19:35:42									69.8	80.6
19:40:39									67.5	76.7
19:41:39									74.8	86
19:47:58									75.5	85.6
20:06:58									69.7	81.7
20:13:52									67.7	77.9
20:25:49									74.6	85.3
20:28:52									69.5	79.8
20:31:36									68.4	78.9
20:34:30									70	80.1
20:42:00									75.1	86.2
20:51:37									70.1	81.4
20:53:55									75.6	86.7
20:57:36									71.7	81.1
20:58:21									71.6	82.9
21:02:09									70.5	79.5
21:03:08									71.3	81.7
21:06:59									78.2	87.6
21:16:05									70.2	80.2
21:22:46									73	83.1
21:27:55									73.4	84.3
22:19:28									81.6	93.3
22:39:32									76.3	87.1
22:57:08									68.1	78.2
23:00:00	22L	22R	15R	22L						

May 12 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
23:12:34									75.8	86.8

Jun 17 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
0:00:00						220	11			
0:00:00	27	22L	22R	22L						
0:03:52									69.1	78.2
0:07:46									70.7	79
0:19:48									77.3	88.1
0:41:26									75.7	85.3
1:00:00						220	9			
1:00:00	22L	22R	15R	22L						
2:00:00						230	10			
3:00:00						220	9			
4:00:00						220	10			
4:33:46									75	84.5
5:00:00						220	12			
5:50:00	27	22L	22R	22L						
6:00:00						230	12			
6:11:37									72.8	81.6
6:14:24									80.5	88.3
6:29:56									69	77.7
6:45:56									77.4	85.4
6:52:48									76.6	85.9
7:00:00						240	12			
7:09:40									80	88.3
7:19:13									77.9	87
7:22:22									76.3	86.1
7:28:05									71	77.6
7:41:26									75.9	84.5
7:55:04									78.2	86.5
8:00:00						240	12			
8:13:44									71.8	82.9
8:27:26									70.2	80.3
9:00:00						240	14	23		
9:08:22									73.7	81.6
9:09:36									69.9	77.6
9:18:47									74.1	84.2
9:28:35									73.5	83
9:40:16									75.9	85.6
9:45:06									72	82.4
9:46:22									70.8	79.6
9:50:16									69.1	79.1
10:00:00						240	10			
10:00:00						240	10			
10:35:45									71.2	81.1
10:50:59									80.9	89.9
10:54:42									79.2	88.3
10:57:25									78.3	87.2
10:59:06									69.1	80.7
11:00:00						230	10			

Jun 17 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
11:00:00						230	10			
11:00:00						230	10			
11:03:51									71.9	81.4
11:09:49									75.3	84.1
11:12:57									78.5	87.7
11:15:31									71	79.6
11:20:04									75.2	84.8
11:25:40									73.4	82.5
11:43:13									76.7	84.9
11:47:28									81.2	90.6
11:50:40									75	85.7
12:00:00						260	8			
12:00:00						260	8			
12:00:00						260	8			
12:13:51									71.2	81.4
12:39:05									75.5	82
12:48:43									67.9	79.4
12:54:28									79.4	88.7
13:00:00						240	12	21		
13:00:00						240	12	21		
13:00:00						240	12	21		
13:07:39									76.8	85.1
13:50:03									70.7	78.2
13:58:31									75	83
14:00:00						240	14			
14:00:00						240	14			
14:00:00						240	14			
14:11:24									69.2	78.6
14:29:08									73.9	81.9
14:30:49									73.1	83.8
14:40:41									76.1	83.7
14:41:50									71.2	78.9
14:47:57									70.9	79.9
15:00:00						240	22	30		
15:00:00						240	22	30		
15:00:00						240	22	30		
15:16:12									71.5	79.9
15:24:52									76.5	85.5
15:42:47									76.4	85.5
15:47:50									67.9	78.7
15:50:00	33L	33R	27	33L						
15:55:03									71.8	81.2
15:56:27									76.3	85
15:57:51									77.6	87.5
16:00:00						310	19	31		
16:00:27									76.1	86.9
16:00:30									73.9	82.6

Jun 17 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
16:02:00									69.9	79.2
16:02:59									77.3	84
16:03:19									73.1	81.6
16:03:55									72.1	84.8
16:05:48									75.6	86.4
16:07:48									72.8	84.2
16:09:33									71.9	83.5
16:11:40									72	84.1
16:14:35									76.1	85.2
16:21:37									73.3	84.3
16:23:59									72.7	83.6
16:27:56									76.5	84.6
16:29:36									72	83.2
16:31:20									67.5	76.6
16:34:28									73.2	82
16:37:39									71.2	81.6
16:39:47									78.8	89.2
16:42:08									68	76.9
16:43:36									70.4	79
16:46:58									72	82.9
16:49:13									77.9	88.2
16:50:39									84.4	93.9
16:51:59									75.6	86.7
16:55:56									75.4	83.6
16:58:00									74.8	86
17:00:00						280	17	28		
17:00:00						280	17	28		
17:05:41									75.8	87.5
17:20:04									72.6	83.5
17:23:59									74.1	85.2
17:26:42									75.7	85.8
17:28:58									72.6	84
17:30:47									70.4	80.1
17:34:35									71.1	79.8
17:36:12									75.9	86.8
17:40:08									72.9	83.3
17:41:57									73.4	84
17:43:13									71.1	81.9
17:44:44									72.9	83.6
17:47:01									71	81.3
17:48:45									77.9	88.1
17:51:02									71.7	83.2
17:54:03									73	83.9
17:56:15									73.1	82
17:57:54									70.9	81.7
18:00:00						270	8			
18:00:00						270	8			

Jun 17 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
18:00:00						270	8			
18:00:58									72.8	83.9
18:03:51									74	85.2
18:05:23									69.4	78.7
18:06:39									76.7	85.5
18:09:33									71.5	81.6
18:11:20									73.9	84
18:13:42									72.9	82.5
18:14:51									74.6	82.9
18:17:15									75.3	85.6
18:19:26									70.7	81.3
18:20:57									68.1	77.2
18:22:19									74.1	82.1
18:23:50									70.7	81.9
18:25:30									71.1	80.9
18:27:03									67.2	76.5
18:29:22									72.6	82.9
18:31:29									81.2	91.4
18:34:34									71.8	81.7
18:35:51									71	81.5
18:38:18									73.3	82.7
18:39:59									71.7	82.2
18:41:53									74	83.3
18:44:56									73.1	83.2
18:46:09									71.1	81.2
18:48:53									72.2	81.7
18:54:36									67.3	76.9
19:00:00						250	9			
19:00:00						250	9			
19:00:00						250	9			
19:00:26									81.6	89.5
19:02:55									69	80.7
19:04:36									72.1	82.1
19:06:00									72	82
19:08:03									70.8	80.5
19:09:52									72.8	81.6
19:14:31									72.9	83
19:18:08									71.3	80.1
19:19:49									69.9	80.4
19:21:14									69.6	77.5
19:23:55									67.4	76.7
19:25:38									75	85.2
19:28:00									71.6	82.7
19:32:46									76.9	87.1
19:33:58									74.9	82.9
19:35:07									73.6	83.5
19:36:27									73.7	83.2

Jun 17 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
19:37:45									70.3	80.8
19:40:38									73.9	83.2
19:43:02									70.6	81.1
19:45:50									72	81.7
19:47:14									73.2	82.9
19:50:11									67.9	77.3
19:52:53									72.9	80.7
19:54:50									71.1	81.6
19:57:24									73.3	81.9
19:58:50									73.6	82.2
20:00:00						260	9			
20:00:00						260	9			
20:00:00						260	9			
20:02:14									72.4	81.9
20:04:15									71.7	81.3
20:06:53									70.8	80.4
20:08:22									72.7	82.7
20:17:00									76.2	85.8
20:29:51									72.8	84
20:33:13									76.1	86.3
20:36:26									74.3	84.4
20:37:52									70.2	79.9
20:39:16									73.6	83.7
20:41:24									73.5	82.8
20:43:19									73.4	83.5
20:45:09									74.1	83.6
20:48:39									72	82
20:50:00									69.5	77.9
20:55:57									70.7	80.7
20:57:14									68.6	78.6
20:59:52									78.1	88
21:00:00						270	10			
21:00:00						270	10			
21:00:00						270	10			
21:01:19									70.7	80.5
21:03:29									67.6	77.6
21:05:13									72.7	83.3
21:07:58									72.2	81.2
21:09:17									70.7	81.1
21:10:45									72	84
21:15:00									77.7	87.1
21:16:26									72	82.5
21:18:20									70	79.6
21:19:53									72.9	81
21:24:26									71.7	82.2
21:26:41									70.6	79.7
21:28:38									75.7	85.1

Jun 17 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
21:30:36									73.7	82.5
21:32:26									72.8	83
21:34:24									71.2	81.1
21:36:16									73.3	84.4
21:37:37									68.2	77.8
21:38:55									73.2	83
21:46:36									69.4	78.5
21:54:59									73.9	83.1
21:57:22									73.6	82.2
22:00:00						280	9			
22:00:00						280	9			
22:02:02									72.2	82.2
22:04:27									71.5	81.4
22:11:44									70.6	81
22:16:55									75.7	84.9
22:31:28									70.1	80.8
22:33:07									73.3	83.5
22:34:41									74.2	84.1
22:39:20									73.2	82.5
22:40:49									69	77.6
22:42:13									70.3	80.5
22:43:42									69.5	81
22:45:15									70.3	79.9
22:46:48									73.2	84
23:00:00						280	9			
23:00:00						280	9			
23:04:00									68.2	79
23:10:27									70.5	80.5
23:14:46									70.3	80.1
23:17:06									72.2	82.4
23:20:54									69.7	80
23:22:25									74.1	83.7
23:25:04									72.4	82.7
23:35:36									71.8	81.9
23:37:33									71.5	80.4
23:48:02									69.6	79.4
23:57:01									74.3	84.7

Dec 15 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
0:00:00						300	9			
0:00:00						300	9			
0:00:00	33L	33R	27	33L						
0:18:49									79.8	90.9
0:22:18									71.6	81.9
0:24:47									73.4	83.5
0:26:55									67.8	80.5
0:29:18									70.1	77.7
0:31:50									73.2	85.6
0:35:16									72.6	82.9
0:40:14									72.4	83.7
0:43:02									73.7	83.1
0:44:11									75.1	85.1
0:46:59									73.1	83
0:55:08									73.1	83.4
0:56:59									75.3	83.1
0:58:46									70.5	83.2
1:00:00						310	11	26		
1:01:42									72.9	84.8
1:08:06									72.2	83.1
1:11:27									68.1	77.8
1:15:58									72.4	81.1
1:23:33									71.5	83.9
1:32:58									69.9	78.1
1:33:22									72.6	80.3
1:34:40									72.7	83.5
1:35:12									71.4	82.2
1:36:09									69	78.3
1:38:05									72.2	84.6
1:39:53									72.5	84.3
1:55:05									69.9	77.2
1:56:33									69.8	79
2:00:00						300	12	22		
2:01:44									70.8	80.7
2:04:52									70.4	78.6
2:09:42									73	80.7
2:17:26									69.2	77.9
2:21:08									72.6	84.5
2:23:53									72.1	83.3
2:32:29									71.1	80.2
2:38:10									70.7	78.7
2:43:10									73.1	81
2:43:45									72.9	80.4
2:46:36									73.7	79.6
2:48:13									78.7	91.1
2:51:16									72.4	79.1
2:55:17									74.9	84.4

Dec 15 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
2:56:15									70.9	79
2:56:45									72.7	81.3
3:00:00						310	13	29		
3:02:19									74.7	79.7
3:05:38									71.3	79.6
3:05:49									71.6	80.9
3:11:08									72.7	80.4
3:13:17									70.7	79.6
3:24:41									72.7	83.9
3:28:24									69.3	80.1
3:31:57									70	79.9
4:00:00						320	16	26		
4:19:58									75	85.6
4:52:27									74.2	84.4
4:56:49									74.7	85.1
5:00:00						320	13	24		
5:27:50									77.9	87.1
5:35:00									71	81.3
5:48:24									70.4	81.9
5:51:59									71.3	81.9
6:00:00						330	13			
6:06:59									70.1	80.5
6:09:49									75.2	86.3
6:12:12									72.1	84.2
6:20:33									75.9	86.3
6:24:11									69.2	79
6:30:00	4R	4L	4R	4L						
7:00:00						320	12			
8:00:00						310	14			
9:00:00						320	11			
10:00:00						330	10	20		
11:00:00						320	7			
11:33:16									71.6	82.7
11:58:00	4R	4L	9	4R	4L					
12:00:00						0	6			
13:00:00						0	5			
13:31:07									71.8	79.7
13:31:52									71.9	81.8
13:33:23									75.3	83.2
13:36:57									73.6	84
14:00:00						70	6			
15:00:00						120	6			
15:00:00						120	6			
16:00:00						0	0			
16:00:00						0	0			
17:00:00						170	6			
17:00:00						170	6			

Dec 15 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
18:00:00						160	5			
19:00:00						0	0			
19:50:00	27	22L	22R	22L						
20:00:00						200	6			
20:00:00						200	6			
20:00:00						200	6			
20:05:06									75.3	84.4
20:07:10									75.5	88
20:11:32									70	78.1
21:00:00						220	5			
22:00:00						210	3			
22:45:52									75.8	86.5
22:55:09									75.8	86.6
23:00:00						210	4			
23:19:58									71.4	82
23:35:29									70.4	79

Feb 5 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
0:00:00						190	5			
0:00:00	33L		15R							
0:02:07									71.3	81.4
0:04:08									71.5	80.7
0:07:30									72.9	82.5
0:10:08									69.4	78.1
0:12:50									70.1	80.3
0:16:02									71.5	81.6
0:18:42									71.6	81.4
0:26:01									70.8	81
0:28:34									72.4	82
0:44:31									70.2	79.8
0:52:25									71.8	83
1:00:00						170	5			
1:19:07									71.9	81
2:00:00						160	4			
3:00:00						140	4			
3:00:00						140	4			
4:00:00						150	3			
5:00:00						140	3			
5:00:00						140	3			
5:30:53									69.6	80.4
5:50:00	4R	4L	9	4R	4L					
6:00:00						120	4			
6:00:00						120	4			
6:19:51									68.1	78.4
7:00:00						130	5			
7:03:11									77.8	83.2
7:14:55									69.4	81.9
8:00:00						100	8			
8:43:20									69.4	78.7
8:51:54									69.6	79
9:00:00						120	9			
10:00:00						100	7			
10:00:00						100	7			
11:00:00						90	13			
11:00:00						90	13			
11:00:00						90	13			
11:30:00	4R	15R VA 4L	9	4R	4L					
11:39:34									70.8	87.2
12:00:00						80	14			
12:00:00						80	14			
12:00:00						80	14			
13:00:00						80	14			
13:00:00						80	14			
13:22:22									70.8	78.3
13:45:00	4R	4L	9	4R	4L					

Feb 5 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
14:00:00						70	16			
14:00:00						70	16			
14:00:00						70	16			
14:23:57									72.6	83
15:00:00						70	19	28		
15:00:00						70	19	28		
15:41:06									73.6	83.6
16:00:00						60	18			
16:31:36									69.8	80.2
16:55:26									69.1	77.9
17:00:00						50	19	28		
17:01:00	4R		4R							
17:14:14									69.6	78
17:16:30									69.3	78.1
17:17:04									76	87.9
17:19:00	4R		9	4R						
17:20:14									70.6	78.4
17:26:17									73.4	80.4
17:30:53									73	80.3
17:36:24									72.3	78.4
17:37:14									74.9	80.8
17:38:15									74	87.2
17:40:33									75.3	81.2
17:41:17									74	81.6
17:41:26									75.1	81.5
17:42:32									77	87.8
17:43:19									73	81.4
17:43:56									73.1	81
17:44:18									72.6	79.2
17:45:27									75.2	84.8
17:46:27									74.3	80.4
17:46:38									71.6	78.6
17:46:51									73.9	83.6
17:47:37									77.4	86.9
17:48:01									77.9	88.9
17:48:52									71.3	79
17:49:05									75	81
17:49:41									75.9	88.7
17:50:23									73.1	80.4
17:51:16									70.8	78.7
17:51:59									74.1	80.5
17:52:30									73.4	80.2
17:53:02									75.8	87
17:53:59									76.8	89.1
17:55:37									77.3	89.8
17:55:57									74.3	84
17:56:39									76.9	90.8

Feb 5 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
17:58:14									70.8	78.2
17:58:26									74.9	81.9
17:58:38									69.4	78.2
17:59:05									71.6	80
17:59:13									72.7	80.1
17:59:25									74.8	82.4
18:00:00						20	22			
18:00:01									72.9	80.1
18:00:43									77.6	91.6
18:01:00	4R		4R							
18:01:59									76.6	84.9
18:02:39									74.3	85
18:02:54									73.4	79.6
18:03:20									77.4	92.7
18:05:32									75.4	84.4
18:06:00									79.6	89
18:06:58									73.6	85.3
18:07:42									79.2	90.7
18:08:54									74	81.1
18:09:10									77.9	84.8
18:09:31									68.2	76.6
18:09:48									77.9	91.9
18:14:50									81.6	97.4
18:16:10									74.5	82.6
18:16:51									72.9	81.2
18:17:09									73.2	83.6
18:17:37									70.6	78.6
18:17:55									77.5	91.6
18:22:24									79.4	96.6
18:24:39									73.4	83.4
18:25:19									72.3	81.6
18:25:47									77.2	84.2
18:26:36									78.9	91.8
18:27:28									73.2	85.5
18:28:16									73.4	80.9
18:28:55									78	91.6
18:30:22									76.7	83.6
18:30:35									77.7	87.9
18:31:22									76.9	83.5
18:31:34									76.3	88.8
18:34:12									79.5	93.2
18:36:08									79.7	93.7
18:37:20									76.4	87.7
18:40:25									78.5	96.6
18:43:02									73.3	80.8
18:43:32									77	88.2
18:44:15									73.3	82.7

Feb 5 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
18:44:50									71.8	79.2
18:45:07									77.5	89.8
18:46:33									76.4	86.3
18:47:32									70.4	79.1
18:47:45									71.8	79.5
18:48:54									73.9	82.5
18:49:24									68.7	78.2
18:50:18									76	89.5
18:51:15									72.2	82.7
18:51:43									74.2	84.9
18:52:32									75.5	87.7
18:53:10									70.8	80.6
18:53:56									72.6	82.4
18:54:19									71	81.4
18:54:43									75.8	87
18:55:28									71.7	78.7
18:56:33									72.5	79.6
18:56:50									75	87.4
18:57:34									76	83.9
18:57:56									74.9	83.5
18:58:28									70.4	78.8
18:59:28									73	81.3
18:59:51									75.9	86.9
19:00:00						30	24	32		
19:00:00						30	24	32		
19:02:17									78.9	93.5
19:03:10									70.4	79.7
19:04:00									77.6	87.9
19:04:39									75	82.5
19:05:16									70	77.4
19:05:33									72.4	82
19:06:03									73.4	81.6
19:06:13									68.4	78.2
19:06:41									72.2	85.2
19:07:21									69.8	78
19:08:29									73.7	80.7
19:09:46									70.7	77.8
19:11:53									68.8	77.9
19:15:40									70.6	78.8
19:16:10									70.7	80.2
19:16:37									73.3	82
19:16:52									71.3	82.3
19:17:18									68.4	76.8
19:17:53									71.3	80.2
19:18:16									70.9	81.9
19:18:51									71	81.1
19:18:58									69.3	79.7

Feb 5 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
19:19:55									70.9	81.7
19:21:17									69.8	78.1
19:21:31									70.1	78.3
19:22:58									70	78.6
19:23:42									67.9	77.6
19:24:18									70.2	78.3
19:25:05									70.3	81.6
19:26:22									73.1	84.2
19:27:59									68.6	80.4
19:29:27									71.6	78.8
19:30:02									72	84
19:30:26									68.9	77.6
19:30:55									70	80.9
19:31:32									73.1	80.4
19:31:58									71.8	82.9
19:32:23									70.6	82.5
19:33:15									71.7	84.3
19:33:44									72.7	82.9
19:34:14									69.9	80.2
19:35:05									70.1	78.5
19:35:46									70.6	84.3
19:36:12									73.8	84.3
19:37:00									73.4	79.2
19:37:23									70.7	83.1
19:37:51									68.3	78.5
19:38:44									68.8	81.2
19:40:30									68.8	78.6
19:40:54									70	81.9
19:41:20									71.1	81.2
19:41:37									72.8	82.7
19:42:18									73.2	87.4
19:43:30									70.2	79.4
19:43:54									71.2	82.1
19:44:38									70.9	81.3
19:45:15									71.5	79.1
19:45:43									72.3	82.2
19:46:05									71.4	86.7
19:48:07									70	80.2
19:48:49									72.5	83.2
19:49:13									73.3	81.1
19:49:37									72.9	84.6
19:50:19									71.3	84.2
19:51:58									72.6	86.4
19:52:30									70.1	82.4
19:52:48									70.1	78.8
19:53:22									75.2	87.1
19:54:24									74.7	85.5

Feb 5 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
19:54:43									68.7	77.6
19:55:05									71.7	83.4
19:56:01									73.6	87.2
19:56:44									72.9	85.3
19:58:11									73.7	89.6
19:59:16									73.9	89.3
20:00:00						20	24	33		
20:00:00						20	24	33		
20:00:30									74.3	88.3
20:02:24									73.8	85.7
20:03:57									76.6	93.4
20:05:40									72.8	82.4
20:06:11									71.8	82.4
20:06:33									71.9	81
20:06:42									71.8	78.7
20:13:13									80.3	98.8
20:15:25									74	84.3
20:15:53									70.9	81.5
20:36:20									84.3	104.2
21:00:00						10	28	39		
21:00:00						10	28	39		
21:00:19									86.4	109
21:06:07									90.4	116.9
22:00:00						0	26	37		
22:00:00						0	26	37		
22:00:32									87.2	105
22:13:45									78.2	95.2
22:18:01									78.4	98.1
22:24:36									75.3	86.5
22:25:15									72.3	83.7
22:25:42									73.8	83.9
22:26:21									75.2	85.7
22:27:56									79	92.8
22:29:42									73.6	83.7
22:30:00									75.3	84.5
22:31:09									76.3	90
22:32:16									72.2	81.8
22:33:26									76.6	88.7
22:34:19									73.7	86.6
22:35:04									75.7	87.4
22:35:55									71.7	82.1
22:36:28									69.4	79.3
22:36:44									72.1	83.3
22:37:17									72.4	80.9
22:39:01									75.3	90.9
22:39:32									74.8	85.3
22:40:20									73.1	84.4

Feb 5 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
22:40:49									74.4	82.9
22:41:24									75.9	91.3
22:43:12									71.9	82.3
22:43:48									70.1	80.7
22:44:04									72.4	81.9
22:44:24									70.3	78.4
22:46:02									73	83.3
22:46:31									71.8	79.9
22:47:13									75.2	88.2
22:48:02									68.4	78.3
22:48:26									75.2	87.4
22:49:51									74.8	87.8
22:50:43									71	79.5
22:51:03									71.8	80
22:51:30									71.4	86.5
22:52:20									73.7	83.8
22:53:35									76.4	89.8
22:54:15									69.7	78.9
22:55:44									73.4	85.3
22:56:46									71	78.8
22:57:15									71.2	82.3
22:57:55									72.9	80.3
22:58:31									73.9	84.1
22:59:09									73.1	84.4
22:59:32									74.8	82.9
22:59:57									72.8	82.4
23:00:00						320	20	31		
23:00:00						320	20	31		
23:00:14									71.9	81
23:00:49									73.3	84.2
23:01:11									71.4	78
23:01:46									73.8	82.7
23:02:18									68.8	77.6
23:02:54									75.6	86.8
23:03:31									75.9	86.6
23:04:08									73.7	81.4
23:04:42									74.8	86.4
23:05:15									74	85.5
23:05:44									75.8	83.7
23:06:00									70.9	77.9
23:07:10									71.7	84.4
23:07:26									79.3	85
23:08:21									75.8	89.9
23:09:41									70	79.8
23:10:32									72.6	84.1
23:11:25									72.3	80.1
23:11:51									74.9	83.7

Feb 5 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
23:12:15									71.9	79.3
23:12:45									69.5	77.6
23:13:32									69.3	79.6
23:13:46									71.5	82.8
23:14:27									72.3	85
23:15:39									68.6	77.1
23:16:23									70.7	78.8
23:17:05									73.3	85.5
23:18:15									75	89.2
23:19:14									71.4	80.9
23:19:43									70.4	82
23:20:23									74.6	87.4
23:21:16									75.9	88.2
23:22:26									71.4	81
23:23:50									71.4	82.8
23:24:07									70.6	80.6
23:25:11									77.1	89.7
23:26:14									77.1	90.9
23:28:44									78	92.3
23:30:29									77.3	90.5
23:32:07									76.8	92
23:34:23									71.7	79.3
23:34:37									69.3	79.4
23:35:21									75.1	86.9
23:35:50									69.3	78.5
23:36:08									68.3	77
23:36:16									70.4	78.9
23:36:36									77.5	85.1
23:36:56									73.1	80.8
23:37:46									73.9	88
23:38:48									75.5	89.6
23:40:50									78.9	97.8
23:47:05									73.5	81.9
23:49:39									78.8	97
23:53:45									77.6	97.7

APPENDIX D

A White Paper:
Assessment of Noise Annoyance,
Paul Schomer (April 22, 2001)

A White Paper: ASSESSMENT OF NOISE ANNOYANCE

April 22, 2001

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A White Paper: ASSESSMENT OF NOISE ANNOYANCE

April 22, 2001

I. INTRODUCTION

1. Background

Environmental noise is defined as the noise emitted from all sources except in the industrial workplace. The major sources of environmental noise are road, rail and air traffic, industries, construction and public works, and the neighborhood. The extent of the environmental noise problem is very large. In the United States, over 40 percent of the population are exposed to transport noise levels exceeding 55 dB(A), and in the EC and Japan, these percentages are even higher (OEDC, 1993). In contrast to many other environmental problems, noise pollution continues to grow, accompanied by an ever-increasing number of complaints (WHO, 1999). Figure 1 shows a recent USA Today first page picture of noise complaints. Industry, aircraft and road traffic are the clear leaders in the generation of noise complaint.

The first principle of the World Health Organization (WHO) Constitution is its definition of health that is given as: "A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." According this WHO definition of health, noise impacts such as population annoyance, interference with communication, and impaired task performance are health issues. Noise has a significant impact on the quality of life and is a health problem in accordance with the World Health Organization's (WHO) definition of health (WHO, 1999).

The effects of noise are seldom catastrophic, and are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. Sleep disruption, the masking of speech and television, and the inability to enjoy one's property or leisure time impair the quality of life. In addition, noise can interfere with the teaching and learning process, disrupt the performance of certain tasks, and increase the incidence of antisocial behavior. There is also some evidence that noise can adversely affect general health and wellbeing in the same manner as chronic stress. (WHO, 1999; Passchier-Vermeer and Passchier, 2000).

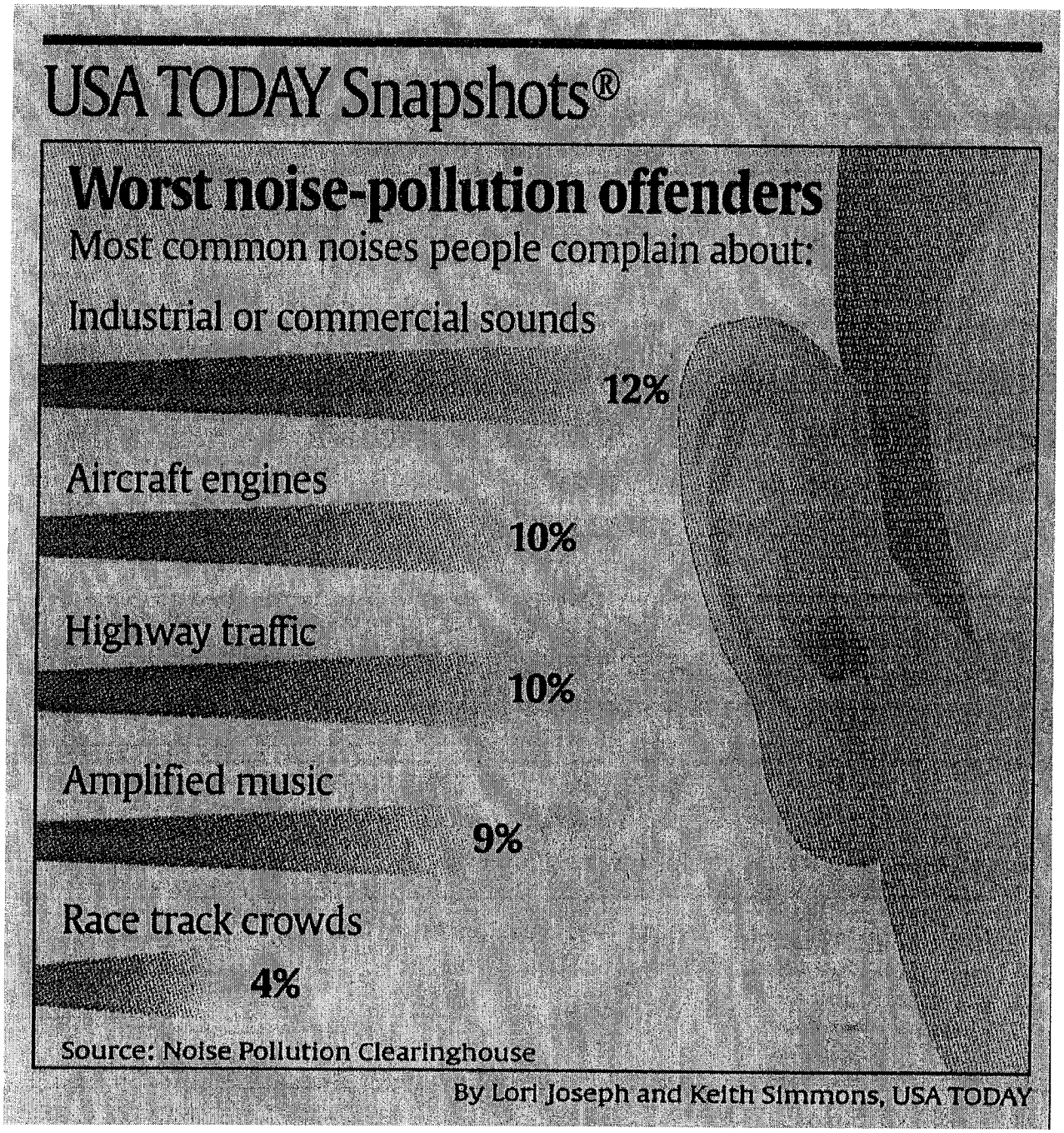

Figure 1. Most common noises that people complain about (USA Today, 2000)

2. Scope

This paper deals with airport noise annoyance in areas where people reside. It does not deal with noise annoyance to people in other settings such as at work, or in parks and wilderness areas.

This paper does not deal with non-auditory effects of noise such as hearing loss or other direct impacts on health or sleep.

This paper does not deal with cognitive or other non-annoyance effects of noise in schools, the workplace, or the home.

3. Introduction to Noise Metrics

A "metric" is defined as something "of, involving, or used in measurement." As used in environmental noise analyses, a metric refers to the unit or quantity that quantitatively measures the effect of noise on the environment. Therefore, the noise metric must correlate with the desired response. For noise studies, this has typically resulted in a confusing proliferation of noise metrics as individual researchers have attempted to understand and represent the effects of noise. As a result, past literature describing environmental noise or environmental noise abatement has included many different metrics.

In the United States, the current metric for assessing aircraft or railroad noise is the A-weighted day-night sound level. This metric embodies several relatively simple concepts.

(a) The “A” frequency-weighting is used to filter the sound in a manner that tends to account for how people respond to noise—an approximation to loudness.

(b) All the sound energy from an event such as a single airplane flyby is summed to account for the event duration as well as its loudness.

(c) The sound energy of each event is summed separately into the total.

(d) The sound energy of each event at night is multiplied by ten before at is added into the total.

First, we predict or measure the A-weighted sound exposure (SE) of each flyby. Sound exposure is basically a measure of the loudness multiplied by the time it takes for the aircraft to flyby or the train to passby; i.e. loudness times duration.

Second, we add up the sound exposure from each individual aircraft operation in order to develop the total sound exposure. In this way we are accounting for the repetitions of each type of aircraft.

Finally, we multiply the sound exposure of each aircraft flyby or train passby that occurs at night by ten before adding it into the daily total. In this manner, we apply a nighttime penalty.

Table 1 provides a very simplified example. Near a small very hypothetical airport, the listed aircraft fly by a given location. For example, each B-727-200 produces 1 sound exposure unit. There are 12 of these flybys during daytime, so, in total, they produce 12 sound exposure units. At night only two of these B-727 flybys results in 20 sound exposure units (2 sound exposure units multiplied by the nighttime penalty of 10). In addition, there are other new, quieter aircraft such as the B-737-800. A flyby of this aircraft produces only 0.05 sound exposure units, so even with many more of this type of aircraft, the total in Table 1 is dominated by the B-727 aircraft. In fact, the total in Table 1 is dominated mainly by just the two nighttime B-727 operations.

Time Period	Sound Source	Sound Exposure (SE)	Number of Events	Total SE
Daytime	B-727-200	1	12	12
	B-737-800	0.05	100	5
	Daytime Total Sound Exposure			17
Nighttime	B-727-200	1	2	20
	B-737-800	0.05	8	4
	Nighttime Total Sound Exposure			24
Day/Night	TOTAL Day-Night Sound Exposure (DNSE)			41

Table 1. Computation of the total day-night sound exposure near to a very hypothetical airport
Note: sound exposures at night are multiplied by ten

In summary:

(a) We measure or calculate the sound exposure (SE) for each event.

(b) We multiply the SE of each nighttime event by ten.

(c) We accumulate the total day-night sound exposure (DNSE).

Typically, the average DNSE of some long period of time is used for environmental noise assessment. Normally, this period of time is a year. That is, the metric used for environmental noise assessment is the yearly-average total day-night sound exposure (YA-DNSE). As Table 1 shows, this metric is very sensitive to individual loud events and to events at night.

Unfortunately, the scientific community uses logarithms to convert this simple linear unit to decibels—a unit of relative energy. This corresponding logarithmic unit is termed the day-night sound level (DNL) and is given by Eq. (1).

$$DNL = 10 \times \lg(DNSE) + 44.6 \qquad (1)$$

where lg denotes the logarithm base 10 of DNSE. Yearly average DNL (YA-DNL) also is given by (1) using YA-DNSE. Table 2 gives the relation between DNL and DNSE for several characteristic values of DNL.

Day-Night Sound Level (DNL) (dB)	**Equivalent Total Day-Night Sound Exposure (DNSE)**	
	Precise Value	**Approximate Value**
75	1088	1000
70	347	333
65	109	100
60	35	33
55	11	10
50	3.5	3
45	1.1	1

Table 2. Relation between day-night sound level (DNL) and total day-night sound exposure (DNSE)

There is a strong consensus that DNL is a good metric with which to describe transportation noise sources. DNL was developed by the US Environmental Protection Agency in the early

1970's. The American National Standards Institute (ANSI, 1996) and the National Research Council (NRC, 1977) recommend the use of DNL as do most federal agencies and administrations. The European Union plans to use day-evening-night sound level, a variant of DNL for noise assessments there, and the International Organization for Standardization (ISO, 1983 and 2000) recommends similar measures. Clearly, although there are other metrics (see Annex A) that can be used to describe aircraft noise, YA-DNL is the metric of choice to describe noise annoyance.

The noise metric, however, is but half the picture. More important than the noise metric are the criteria values chosen to represent various degrees of adversity. A poor metric with appropriate criteria values can do a fair job in portraying the community reaction to noise, but the best metric will fail if the criteria values are too large or too small.

4. Purpose

The purpose of this paper is to collect and tabulate recommended appropriate minimum criteria values for the DNL metric in various types of communities and settings. Included in this collection are all recommendations by USA boards and agencies that have cognizance over noise producing sources, all national and international standards setting bodies, and international organizations in which the USA participates.[1]

(a) This paper shows that nearly all agencies and boards, standards setting bodies, and international organizations that have cognizance over noise producing sources use a DNL criterion value of 55 dB as the threshold for defining noise impact in urban residential areas. In fact, of this large number of agencies, boards, standards setting bodies, and international organizations, only the Department of Defense and the Federal Aviation Administration suggest a criterion value for DNL that is higher than 55 dB.[2]

[1] This collection does not include agencies or boards that do not use the DNL metric—notably just the Federal Highway Administration.

[2] The Department of Housing and Urban Development has no cognizance over noise sources. However, they term DNL levels from 65 dB to 75 dB as "normally unacceptable" and DNL levels from 60 to 65 dB as "normally acceptable." Levels below 60 dB are termed "clearly acceptable." (HUD, 1985)

(b) The policies of FAA/DOD (and HUD) all were developed in the early 1970's and earlier (e.g., HUD, 1971). In contrast, most of the agencies and boards, standard setting bodies, and international organizations have established their policies after 1995. In particular, the World Health Organization recommendations (WHO, 1999) are based on over 25 years more worldwide research into noise effects than are the earlier FAA/DOD policies.

(c) This paper shows that no single DNL criterion is equally applicable to all residential situations and all types of residential communities. A sizeable number of agencies and boards, standards setting bodies, and international organizations that have cognizance over noise producing sources recommend a DNL criterion value that is less than 55 dB as the threshold for defining noise impact in sparse suburban and rural residential areas.

(d) This paper shows that significant evidence exists to suggest that aircraft noise is more annoying than is road traffic noise for the same DNL level.

II. METRICS AND CORRESPONDING CRITERIA FOR ASSESSING NOISE ANNOYANCE

1. Agencies and Boards that Recommend Higher Criterion Values for DNL

a. The Federal Aviation Administration

The Federal Aviation Administration (FAA) uses the DNL metric for assessing the noise in environmental assessments and so-called "Airport Part 150 Studies." These latter are noise compatibility/land use studies designed to help mitigate noise impact in the vicinity of airports. The FAA recommends a minimum criterion value of 65 DNL to assess impact in residential areas (FAA, 2000). They do not differentiate between urban, suburban or rural areas. Rather, their recommendation of 65 DNL is independent of the type of residential area. With virtually no exceptions, the FAA provides noise mitigation funds in residential areas only when the DNL exceeds or is predicted to exceed 65 DNL. The FAA terms a DNL level of 65 dB as "the level of significance for assessing noise impacts" (FAA, 2000).

b. Department of Defense

The Department of Defense (DOD) uses the DNL metric for assessing noise in environmental assessments and so-called "Air-Installation Compatible Use Zone Studies.[3]" These latter are noise compatibility/land use studies designed to help mitigate noise impact in the vicinity of air installations. The DOD recommends a minimum criterion value of 65 DNL to assess impact in residential areas (DOD, 1977). They do not differentiate between urban, suburban or rural areas. Rather, their recommendation of 65 DNL is independent of the type of residential areas.

c. Department of Housing and Urban Development

The Department of Housing and Urban Development (HUD) noise policy was developed in 1971 (HUD, 1971). However, HUD has no cognizance over noise sources. Rather, they are included here for completeness. In a more recent 1985 document (HUD, 1085), they term DNL levels from 65 dB to 75 dB as "normally unacceptable [for housing]" and DNL levels from 60 to 65 dB as "normally acceptable." Levels below 60 dB are termed "clearly acceptable." (HUD, 1985)

[3] The DOD (notable the Army) uses related metrics and procedures to assess the impulsive noise from weapons such as small arms, artillery and demolition.

2. Agencies and Boards of the Federal Government that Recommend Lower Criterion Values for DNL[4].

In addition to the FAA and the DOD, many other administrations, agencies, commissions, and boards of the Federal Government have oversight over noise producing sources. These include the Federal Transit Administration, the Federal Railroad Administration, the Surface Transportation Board, the Federal Highway Administration, and the Federal Energy Regulatory Commission. Further, a mission of the National Research Council, a part of the National Academy of Science, is to be an advisor on scientific matters like this to the entire Federal Government.

a. The Federal Transit Administration

The Federal Transit Administration (FTA, 1995) uses the DNL metric for assessing the noise from mass transit activities. Mass transit includes such items as rail rapid transit or light rail transit, commuter rail, diesel buses, electric buses and trackless trolley, bus storage yards, rail transit storage yards, maintenance facilities, stations, and subways. Figure 2 gives the FTA criteria. These criteria change with the noise receiver land use and with the existing noise at the receiver.

In the FTA report they explain the land use categories and corresponding metrics by which to interpret Figure 2. However, in this figure, Category 2 includes residences and buildings where people normally sleep. This category includes homes, hospitals and hotels, and the metric for Category 2 is DNL. Figure 1 shows, for example, that if the existing DNL is 55 dB, then start of impact for a new or revised project occurs when its noise exceeds DNL 55.5. In fact, for an area where the existing noise is very low, impact begins when the new noise source levels are less than 50 dB. In very loud areas where the existing noise is DNL 65 dB, a new project can only produce just over 60 dB. These FTA criteria are much lower than the FAA/DOD criterion of DNL 65 dB.

[4] For completeness, this section also includes the only Federal Agency or Board that does not use the DNL metric—the Federal Highway Administration.

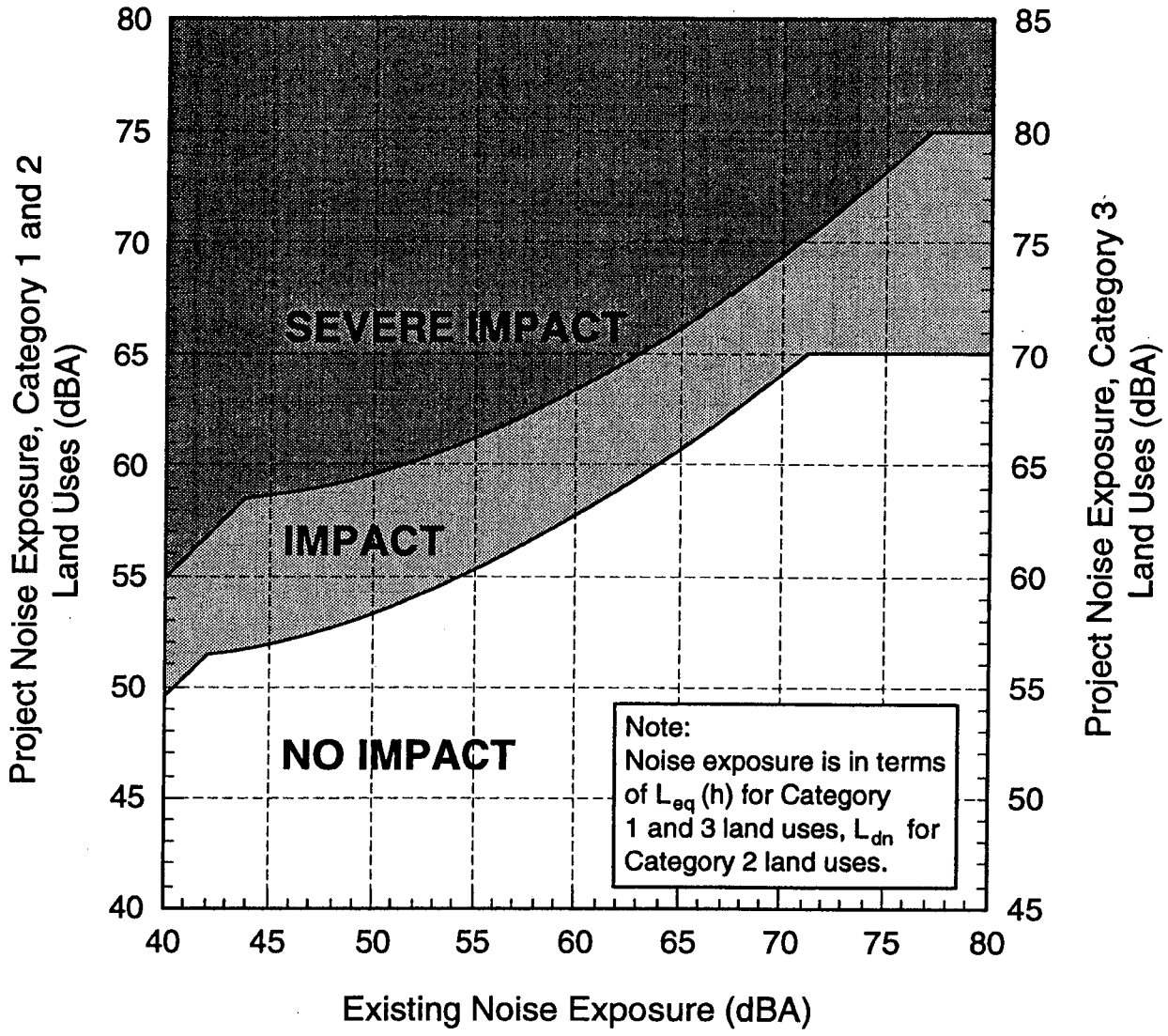

Figure 2. FTA noise impact criteria for transit projects.

The FTA (1995) includes a background discussion about their development of their noise impact criteria. In this background, they cite the US Environmental Protection Agency (EPA, 1974) recommendation of DNL 55 dB to develop their curve of impact. Further, the FTA states that they use the FAA/DOD criteria of DNL 65 dB to define their curve of severe impact.

b. The Federal Railroad Administration

The Federal Railroad Administration (FRA, 1998) uses the DNL metric for assessing the noise from mass transit activities. This effort has been motivated in part by the need to assess new, high-speed trains. The FRA uses exactly the same criteria as is used by the FTA as given above. Like the FTA, the FRA terms the noise level represented by DNL 65 dB as "severe impact."

c. The Surface Transportation Board

The Surface Transportation Board (STB, 1998) uses the DNL metric for assessing the noise from freight railroads. The STB uses the same criteria as is used by the FTA and FRA as given above.

d. The Federal Highway Administration

The Federal Highway Administration (FHWA, 1995) does not use DNL for noise assessment. Rather, they use two other metrics. One is termed "the busy-hour L10." The other is termed "the busy-hour LEQ." For criteria, the FHWA requires that the LEQ for the busiest hour of the day be at most 67 dB or that the L10 for the busiest hour of the day be at most 70. However, state agencies are required to select a tolerance of at least one decibel and are free to select a somewhat higher tolerance. Thus, with the tolerance, the FHWA criteria are, at most, 66 dB for the LEQ metric or 69 dB for the L10 metric. While some relation exists between these metrics and DNL, the correlation is not particularly good or well documented. For example, some measurements of DNL show it to be greater that the busy-hour LEQ and others show it to be less.

In summary, the FHWA uses metrics and criteria that differ greatly from DNL. Moreover, the FHWA allows states latitude in the tolerance chosen with which to define onset of impact.

e. The Department of Transportation

The Department of Transportation (DOT) recognizes that the various modes within the department have different models, metrics, and criteria. In a report to Congress (DOT, 2000) they state:

> "A unified DOT multi-modal noise model is feasible and desirable. It would enable the evaluation of the noise impacts from multiple sources without the need for multiple models. As an example, using MNM [Multi-modal Noise Model], evaluation of the noise impacts of an airport with several highways and a rapid transit line running to the airport would no longer require the use of two computerized and one non-computerized model to perform an assessment. In addition to facilitating analysis, a multi-modal model would enable one to more clearly assess and compare the contributions of each source to the total noise exposure. In the present situation, the commonly used noise descriptors [metrics] would differ from one mode to another. Even for the same transportation mode, criteria values would differ [different criteria from one mode to another when using the same metric]."

Clearly, the DOT recognizes that there is no common noise metric or criteria within the DOT let alone within the Federal Government.

f. The Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission (FERC) has issued regulations (FERC, 1999) that require:

> "the noise attributable to any new compressor stations, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed a day-night level (Ldn) of 55 dBA at any pre-existing noise-sensitive area (such as schools, hospitals, or residences)."

FERC developed this policy based on the USEPA-identified level of significance of DNL 55 dB. Applied to an airport, the FERC rules would require, for example, that if a new runway were added then the airport levels would have to be below DNL 55 dB at all existing residences in the vicinity of the airport.

g. The US Environmental Protection Agency

The US Environmental Protection Agency (EPA, 1974) recommended the DNL metric and 55 dB and the "level requisite to protect health and welfare with an adequate margin of safety." The USEPA recommends the criterion level of 55 DNL to other federal agencies. For example, in a recent letter, the USEPA regional administrator, Ms. Mindy Lubber, asks the FAA to assess

the noise of a proposed new runway at Boston's Logan Airport using DNL and a criterion value of 55 dB (EPA, 2000).

h. The National Research Council

The National Research Council (NRC) Committee on Hearing, Bioacoustics and Biomechanics developed guidelines for preparing environmental impact statements on noise (NRC, 1977). The NRC has chosen DNL 55 dB as the criterion value for noise impact in residential areas.

Figure 3 shows the NRC screening requirements for noise assessments in various situations. This figure shows, for example, if the existing DNL is 50 dB, then full environmental documentation is required for project DNLs down to 40 dB. This NRC requirement for project documentation down to 40 dB is lower than the recommendation by all other Bodies and Boards and it is much lower that the FAA/DOD level of 65 dB. On the basis of sound energy, the National Research Council recommends documentation of sound energies that are 1/300th the energy recommended by the FAA/DOD.

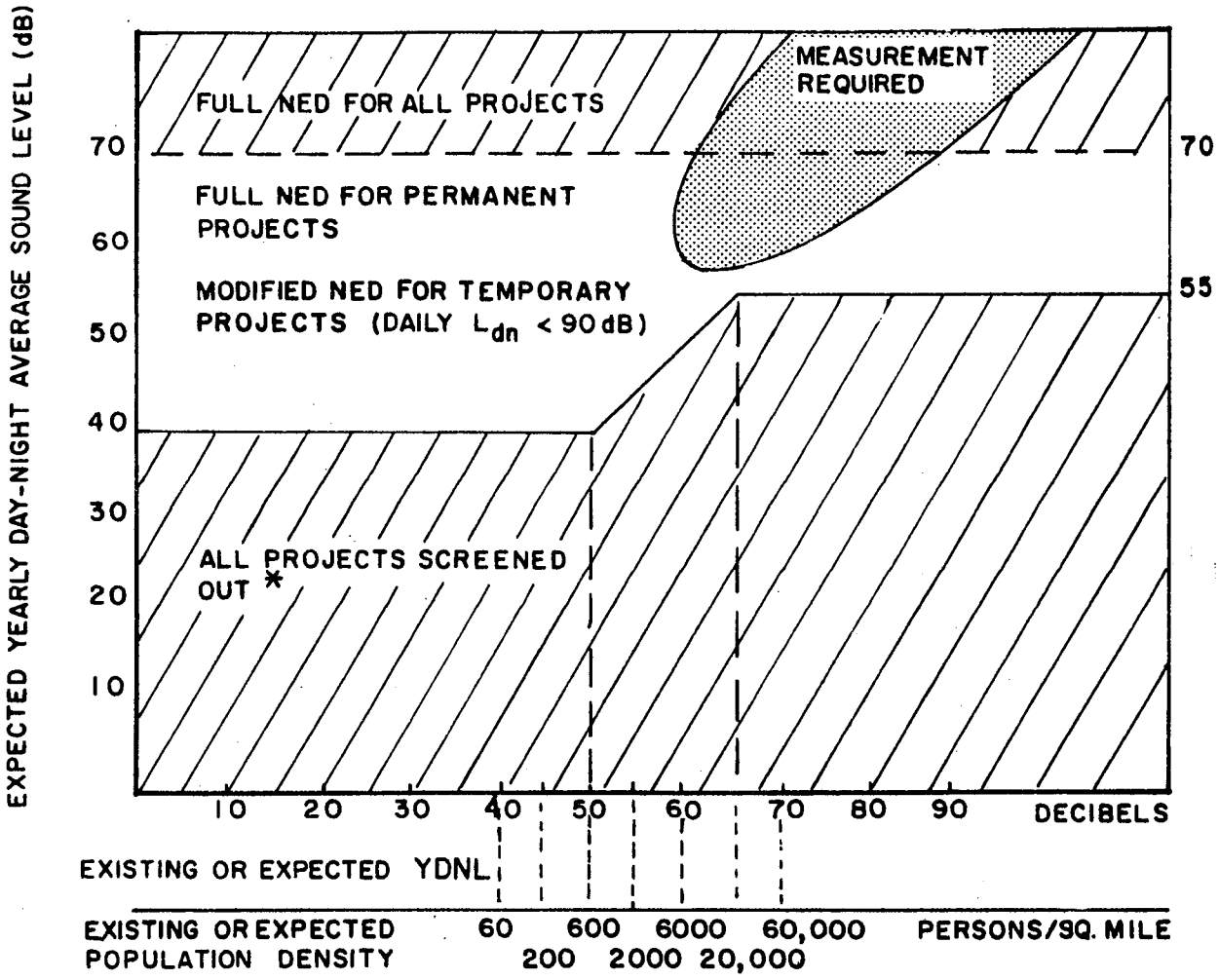

Figure 3. NRC screening diagram for the expected yearly average DNL to determine whether or not full noise environmental documentation (NED) is required

3. National Standards Setting Bodies

a. American National Standards Institute

As noted above, the American National Standards Institute (ANSI, 1996) recommends the DNL metric. The criterion level set by ANSI for housing and similar noise sensitive land uses is a DNL of 55 dB (ANSI, 1998).

b. American Public Transit Association

The American Public Transit Association (APTA) uses the A-weighted maximum sound level (LAmax—see Annex A) during a passby for their metric. Their criteria depend on the land category and housing type. They divide residential zones into three groups (low, normal, and high density) and two types (single family and multi-family). able 3 gives the APTA criteria. For example, for low-density single family homes, they recommend an LAmax of 70 dB.

Density	Residential Zone Description	Housing Type	
		Single Family	Multifamily
Low	Open space, parks, suburban residential or recreational areas; no nearby highways or boulevards	70	75
Normal	Quiet apartments and hotels, open space, suburban residential, or occupied outdoor areas near busy streets,	75	75
High	Average semi-residential/commercial areas, urban parks, museums, and non-commercial public building areas	75	80

Table 3. APTA (1989) LAmax criteria for noise as a function of residential zone and housing type (The LAmax apply to the passby noise from any single vehicle [e.g., bus, train, or trolley].)

4. International Bodies

a. The World Health Organization

The World Health Organization (WHO, 1999) recommends (Table 4) a 16-hour daytime LEQ of 55 dB and, approximately, a 45 dB nighttime LEQ to prevent "serious annoyance." These numbers are equivalent to a DNL of 55 dB. WHO further recommends that, during the night, the maximum level (fast) of any single event not exceed 60 dB. To prevent annoyance, WHO recommends levels that are 5 decibels lower—a daytime LEQ of 50 dB and a nighttime LEQ of 40 dB. These numbers are equivalent to a DNL of 50 dB.

Impact Characterization	Daytime LEQ	Nighttime LEQ	Approximate DNL	Nighttime Lamax
Serious Annoyance	55	45	55	60
Moderate Annoyance	50	40	50	60

Table 4. WHO DNL criteria for noise annoyance in residential areas (The LAmax level is for protecting from sleep disruption.)

b. The World Bank Group

The World Bank Group (WBG, 1998) has developed a strong program in pollution management so as to insure that their projects in developing countries are environmentally sound. Noise is one of the pollutants covered by their policy. They set the following noise limits for general industrial projects including foundries, iron and steel manufacturing, and thermal power plants (Table 5):

Receptor	Time Period	Time Period LEQ	Equivalent DNL
Residential, institutional, educational	Daytime	55	55
	Nighttime	45	
Industrial, commercial	Daytime	70	--
	Nighttime	70	

Table 5. World Bank Group noise limits for industrial projects to which money is lent

c. The International Organization for Economic Co-operation and Development

The International Organization for Economic Co-operation and Development (OECD) has similar concerns to those expressed by the policy of the World Bank Group. OECD has set "Pollution Prevention and Control Environmental Criteria for Sustainable Transport" (OECD, 1996). They state:

> "Noise finds a place among these criteria on account of the high level of concern about noise from motorized transport and the possible adverse impacts of noise on human health and quality of life."

OECD goes on to support the levels recommended by WHO. Further, they suggest the following environmentally sustainable transport noise levels based on the (noise) receiving community (Table 6). Clearly, like the WBG, OECD recommends a DNL of 55 dB, and, in rural areas, it lowers its recommendation to DNL 50 dB.

Land Area	Time Period	Time Period LEQ	Equivalent DNL
Urban	Daytime	55	55
	Nighttime	45	
Rural	Daytime	50	50
	Nighttime	40	

Table 6. OECD suggested transport noise levels for the land area indicated

5. A Discussion on Criterion Values

The vast majority of federal administrations, agencies, boards, and commissions use DNL 55 dB or lower as a level of significance. Only the FAA, DOD, and HUD use DNL 65 dB as a level of significance. In terms of terminology, what the FAA terms "the Federal Government's level of significance for assessing noise impacts," the FTA and FRA term "severe impact." These policies stem from the early 1970s (e.g., HUD, 1971).

The NRC goes further, and, in many instances, recommends assessments when the project noise exceeds a DNL 40 dB—a level that is below the criterion level of all other agencies and boards and is 25 dB below the FAA/DOD level. In terms of sound energy, the NRC recommendation is at a value that is 1/300th the FAA/DOD value.

ANSI, WHO, The World Bank Group and OECD all recommend a DNL criterion value of 55 dB and OECD recommends an even lower criterion level in rural areas.

For some of those organizations and groups that use metrics that differ from DNL, it is possible to examine their criteria against various noise sources. For example, the APTA criterion of 70 dB LAmax for low-density single-family housing areas is frequently exceeded by aircraft noise several to many miles from an airport and is exceeded by road traffic noise about 250 ft from a highway. The WHO nighttime limit of 60 dB LAmax is frequently exceeded by aircraft noise many miles from an airport, by road traffic noise about 500 to 1000 ft from a highway, and by train noise about 1000 ft or more from the tracks.

Nearly all of the policies that set lower criterion values for DNL stem from 1995 or later and, thus, are based on 25 more years of noise effects research.

Of all of the boards and agencies, standards setting bodies, and internationals organizations, one should consider the World Health Organization and the National Research Council as primary authorities on acceptable levels of pollutants. They are charged with creating this type of scientific position activity. WHO terms DNL 55 dB as engendering serious annoyance and creating an unhealthy environment, and WHO terms DNL 50 dB as engendering moderate annoyance. The NRC goes further, and, in many instances, recommends assessments when the project noise exceeds a DNL 40 dB.

III. ASSESSMENT CRITERIA BASED ON TYPE OF LAND AREA

1. A History of Normalization Factors

As previously noted, DNL is commonly used to quantify and assess environmental noise. A keystone to noise assessment is the dose-response relationship. With such a relationship, one can relate community response to noise level. Since the seminal work by Schultz (1978), "high annoyance" has been the response measure of choice—especially in the United States. Figure 4 shows the relationship developed by Schultz between the DNL for various transportation noise sources and the corresponding community response expressed as the percentage "highly annoyed." One hallmark of this figure, and many like it, is the large amount of scatter to the data. The 90 percent prediction intervals are quite large. In this figure, the 90 percent prediction intervals are about 20 to 25 percent wide at mid levels. The prediction interval can be understood to mean that if one were to survey many communities where the DNL was, for example, 65 dB, then one would expect to find that the rate of high annoyance was between about 5 and 28 percent in 90 percent of the communities surveyed, with even larger variations in one of ten communities.

The EPA (1974) adopted the use of DNL for noise assessment. In their report they again attempted to relate noise levels with community reaction as measured by complaints and legal actions. Figure 5 shows basic data available at that time showing community reaction versus DNL. Obviously there is a great deal of scatter to these data. At 55 DNL, reactions range from "*no reaction*" to "*severe threats of legal action or strong appeals to local officials to stop noise.*" Some may question the usefulness of figures like Figure 5 in view of the large amount of scatter to the data. There is just too much scatter to the DNL data.

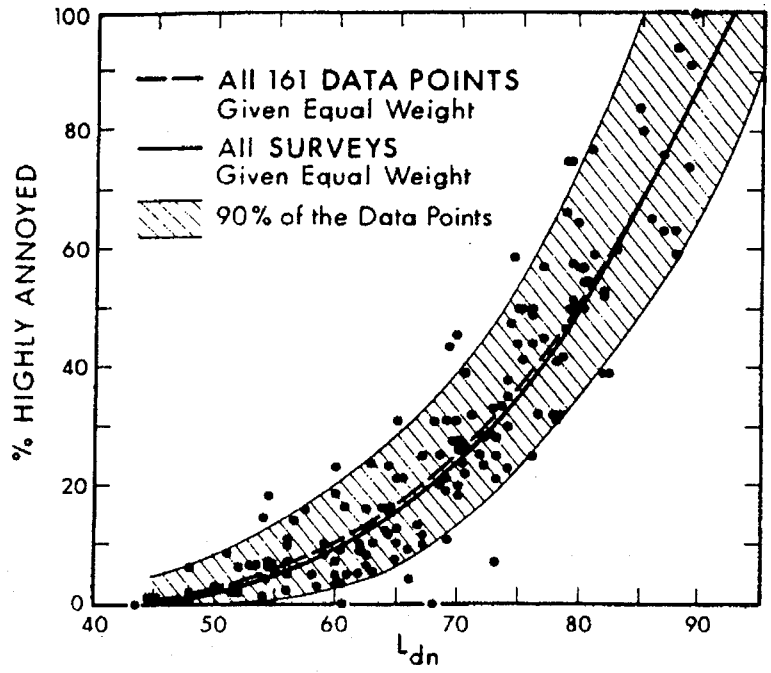

Figure 4. The Schultz relationship between percent highly annoyed and DNL for transportation noise sources

In an attempt to reduce the scatter to the DNL data, the EPA (1974) suggested the use of "normalized" DNL. Normalized DNL is the basic DNL level with a number of adjustments added to account for specific characteristics and factors of the sound. Table 7 shows the EPA-suggested adjustment factors and the amounts of the adjustments. Factors include seasonal corrections, corrections for the setting, corrections for previous exposure and community relations, and corrections for sound character (tonal or impulsive). Figure 6 shows the data from Fig. 5 after they have been normalized using this procedure. Clearly, in Fig. 6 the data compress and there is much less scatter to the data than in Fig. 5.

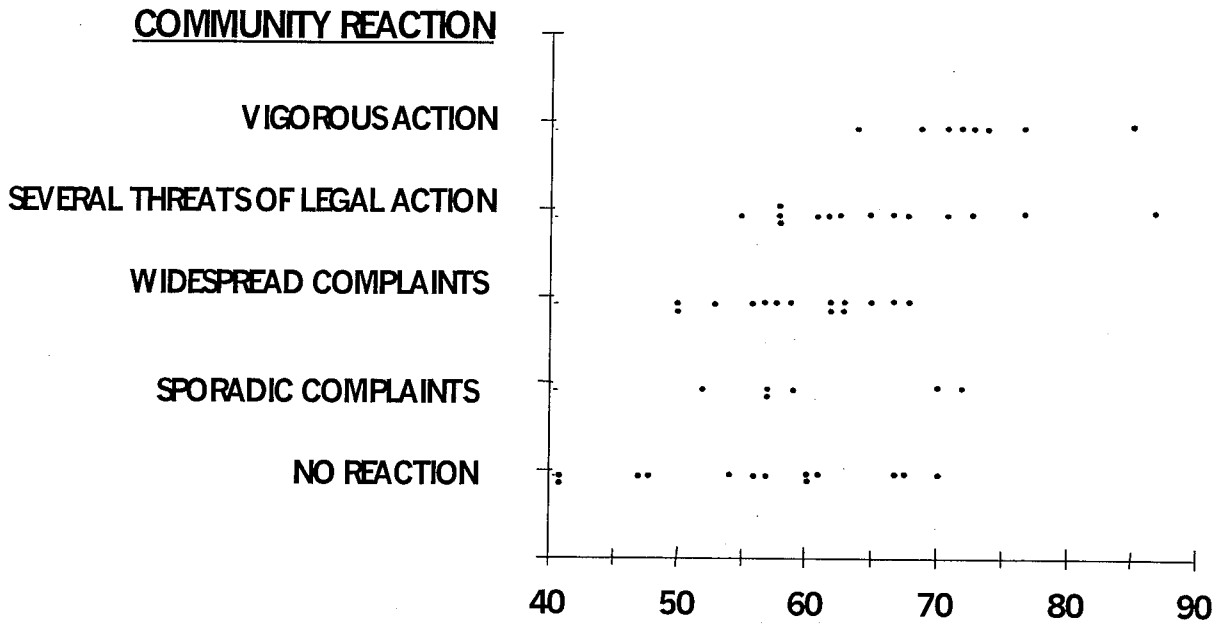

Figure 5. Community reaction for the non-normalized DNL indicated. (After EPA, 1974)

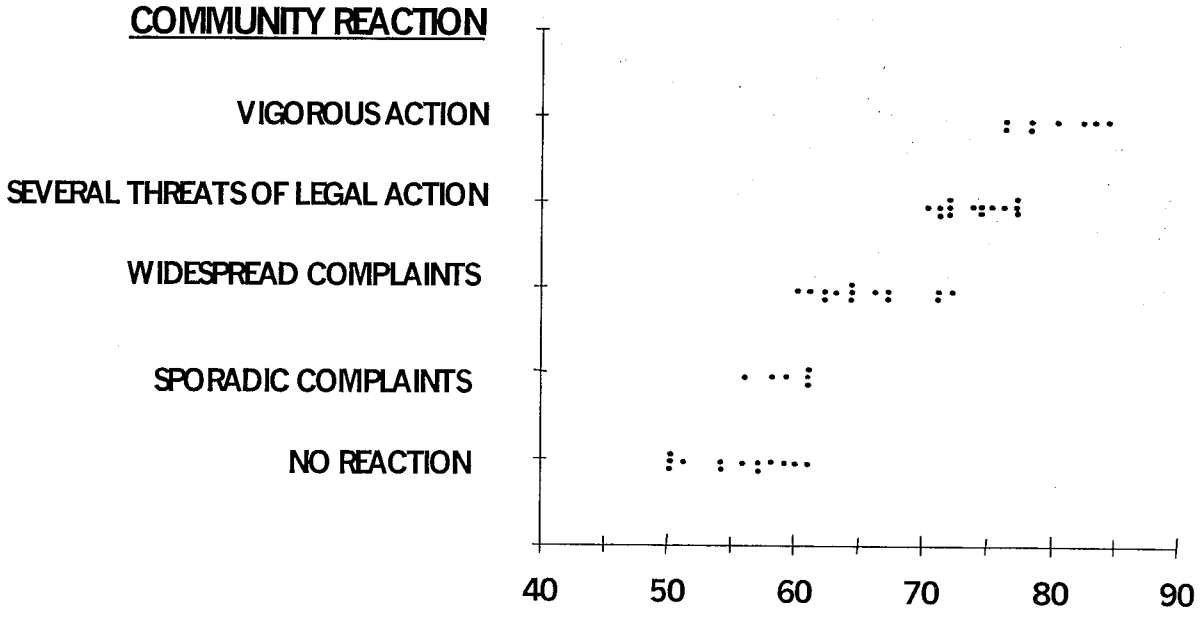

Figure 6. Community reaction for the normalized DNL indicated. (After EPA, 1974)

Type of Correction	Description	Amount of Correction to be Added to measured DNL (dB)
Seasonal Correction	Summer (or year-round operation)	0
	Winter only (or windows always closed)	–5
Correction for Outdoor Noise Level Measure in Absence of Intruding Noise	Quiet suburban or rural community (remote from large cities and from industrial activity and trucking)	+10
	Normal suburban community (not located near industrial activity)	+5
	Urban residential community (not immediately adjacent to heavily traveled roads and industrial areas)	0
	Noisy urban residential community (near relatively busy roads or industrial areas)	–5
	Very noisy urban residential community	–10
Correction for Previous Exposure and Community Attitudes	No prior experience with the intruding noise	+5
	Community has had some previous exposure to intruding noise but little effort is being made to control the noise. This correction may also be applied in a situation where the community has not been exposed to the noise previously, but the people are aware that bona fide efforts are being made to control the noise.	0
	Community has had considerable previous exposure to the intruding noise and the noisemaker's relations with the community are good	–5
	Community aware that operation causing noise is very necessary and it will not continue indefinitely. This correction can be applied for an operation of limited duration and under emergency circumstances.	–10
Pure Tone or Impulse	No pure tone or impulsive character	0
	Pure tone or impulsive character present	–5

Table 7. Corrections to be added to the measured DNL of intruding noise to obtain normalized DNL (EPA, 1974)

In reality, the normalization factors in Table 7 were in use long before the EPA's Office of Noise Abatement and Control (ONAC). The adjustment method was incorporated in the first Air Force Land Use Planning Guide in 1957 (USAF, 1957) and was later simplified for ease of application by the Air Force and the Federal Aviation Administration.

Today, the same issues exist as in the 1950s, 60s and 70s. Dose-response relationships are used to relate DNL to high annoyance and to complaints, but there is great uncertainty to these relationships. Figure 7 shows a more recent analysis of attitudinal survey data including the original Schultz-studied surveys and many additional surveys (Finegold *et al.*, 1994). If anything, with more data, the scatter is greater and the prediction intervals are larger still. At DNL 65, the 90 percent prediction interval in Fig. 7 ranges from about 1 to 40 percent.

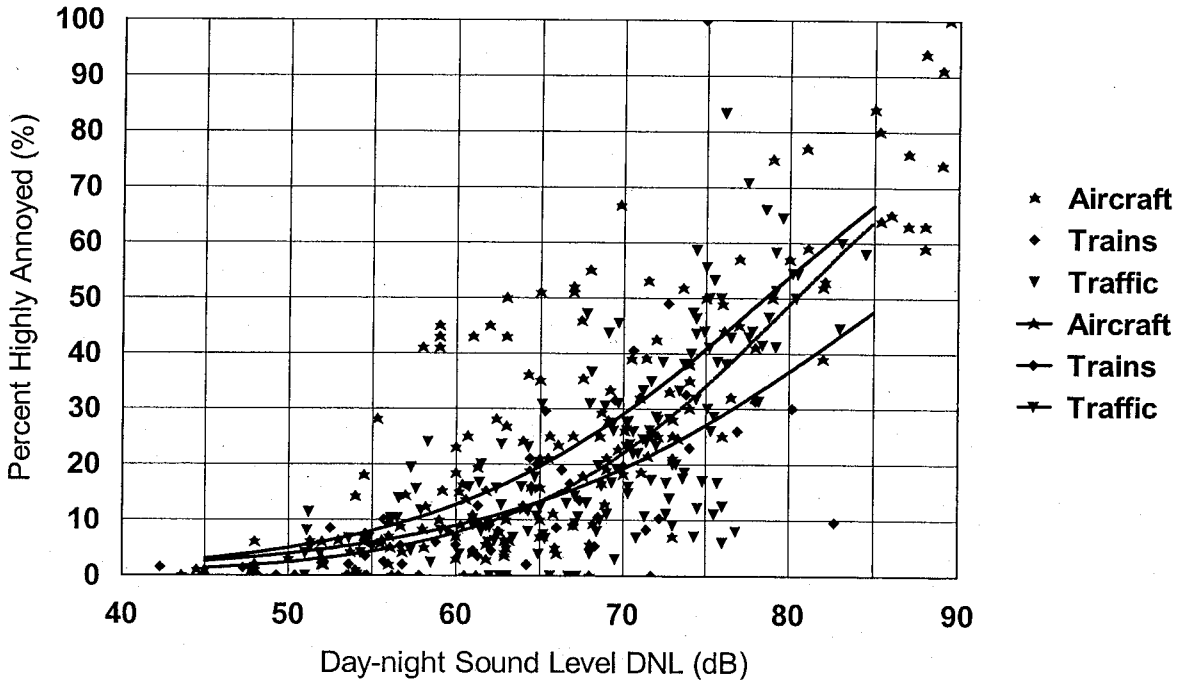

Figure 7. A recent compilation of attitudinal survey results including the original Schultz data and many additional surveys (Note the large amount of scatter to the data.)

2. Normalization for Community Type or "Type of Neighborhood"

The following discussion is focussed on Factor 2 in Table 7: Correction for Outdoor Noise Level Measured in Absence of Intruding Noise. Some have interpreted this factor to be focussed on the difference between the existing noise levels and the noise levels generated by the source in question. This is not a correct interpretation. In fact, several researchers (e.g., Fields, 1998; Taylor *et. al*, 1980) have shown that the background noise in an area has little effect on the annoyance engendered by aircraft noise. But this Factor 2 of the EPA is not a correction for background; it is a correction for the community setting.

As early as 1977, the FAA (1977) in a report entitled *Impact of Noise on People* states:

> "Type of neighborhood – instances of annoyance, disturbances and complaint associated with a particular noise exposure will be greatest in rural areas, followed by suburban and urban residential areas, and then commercial and industrial areas in decreasing order. The type of neighborhood may actually be associated with one's expectations regarding noise. People expect rural neighborhoods to be quieter than cities. Consequently, a given noise exposure may produce greater negative reaction in a rural area.

In 1985 the FAA (1985) says much the same in a report entitled *Aviation Noise Effects*. Here they state:

> "Type of Neighborhood. Instances of annoyance, disturbances and complaint associated with a particular noise exposure will be greatest in rural areas, followed by suburban and urban residential areas, and then commercial and industrial areas in decreasing order. The type of neighborhood may actually be associated with one's expectations regarding noise there. People expect rural neighborhoods to be quieter than cities. Consequently, a given noise exposure may produce greater negative reaction in a rural area.

Willits *et al.* (1990) provides proof for these FAA and EPA assertions. He has studied community expectations in rural settings. Table 6 reproduces Willits' data. Many potentially positive attributes of rural living are given. Of these, the number one expectation to rural living is "peace and quiet." This positive attribute of rural living ranks far above virtually all other perceived rural attributes. For example, peace and quiet is much more expected than is a low

crime rate, and these expectations are about the same for rural, urban, and suburban respondents. That is, everyone expects rural areas to be bastions of peace and quiet.

Not only the Air Force and the EPA have recommended these normalization factors. In a feature article in Noise News International, Eldred and von Gierke (1993), two of the most respected names in environmental noise assessment, recommend these normalization factors. The NRC recommends that required environmental noise documentation levels be based on population density (Figure 3) which is a good surrogate for type of community. The OECD recommends a criterion level of 50 dB in rural areas and a criterion level of 55 dB in urban areas, and the APTA sets lower limits in low-density single family areas than in higher density areas or in areas with mulit-family housing. Very recently, ISO affirmed a draft revision to ISO 1996 (2000). This Draft International Standard qualifies use of the "Schultz Curve," for assessing degree of annoyance by stating:

> "Research has shown that there is a greater expectation for and value placed on "peace and quiet" in quiet rural settings. In quiet rural areas, this greater expectation for "peace and quiet" may be equivalent to up to 10 dB."

Item	Rural (N=571)[a]			Urban (N=384)			Suburban (N-284)		
	Agree	Undecided	Disagree	Agree	Undecided	Disagree	Agree	Undecided	Disagree
Rural life brings out the best in people.	63.2	20.8	15.9	46.5	27.2	26.4	48.9	26.4	24.6
Rural families are more close-knit and enduring than other families.	71.6	13.0	15.4	61.2	11.7	27.1	66.7	11.3	22.0
Because rural life is closer to nature, it is more wholesome.	85.6	7.2	7.2	73.7	8.1	18.2	72.9	7.7	19.4
Rural communities are the most satisfying of all places to live, work and play.	68.8	13.7	17.5	39.8	18.0	42.2	43.7	13.7	42.6
Rural people are more likely than other people to accept you as you are.	65.7	13.1	21.2	53.4	14.6	32.0	51.4	13.7	34.9
Neighborliness and friendliness are more characteristic of rural communities than other areas.	77.7	8.8	13.5	69.0	11.2	19.8	64.8	10.9	24.3
Life in rural communities is less stressful than life elsewhere.	69.3	8.1	22.6	60.7	8.6	30.7	63.0	8.8	28.2
There is less crime and violence in rural areas than in other areas.	73.4	8.1	18.6	67.4	9.7	23.0	70.8	10.6	18.7
Rural areas have more peace and quiet than do other areas.[b]	**94.6**	**1.9**	**3.5**	**89.3**	**3.4**	**7.3**	**91.9**	**1.8**	**6.3**

a Number of cases varies slightly from item to item due to missing data.
b Emphasis added.

Table 2. Responses in percent from rural, urban and suburban residents to items dealing with positive images of rural life (after Willits *et al.*, 1990).

2. The Present Situation

Virtually all environmental noise analyses ignore the EPA normalization factors. The FAA ignored the normalization factors in their analysis of the so-called Expanded East Coast Plan (Muldoon and Miller, 1989) and in the siting of the new Denver Airport (Colorado, 1997). In both cases the community reaction was and is far in excess of that predicted without the use of normalizing factors. In particular, the FAA ignored the normalization factor that deals with the type of community. This, in spite of the FAA's own documents attesting to the importance of this factor (FAA, 1977; FAA, 1985).

3. Discussion

The EPA normalization factors for the type of community are justified and needed not on the basis of the background sound but on the basis of the community expectations for a quiet environment. The best surrogate for community type is population density as suggested by the NRC. For purposes of noise assessment, a population density of less than 500 people per square kilometer (about 1250 per square mile) is suggested as the threshold for a rural area where the criteria for DNL should be lowered by 10 dB. Also, a population density of less than 2000 people per square kilometer (about 5000 per square mile) is suggested as the threshold for a quiet suburban area where the criteria should be lowered by 5 dB. These population densities are based on ANSI (1993).

IV. ADDITIONAL DISCUSSION

It is clear that a large majority of federal agencies, administrations, commissions, and boards use DNL 55 dB as their criterion for noise impact. It is also clear that non-government cognizant groups like the American National Standards Institute and quasi-government groups like the National Research Council recommend DNL 55 dB as the appropriate criterion in residential and other similarly noise sensitive areas. It is further clear that all of the major international cognizant bodies including the World Health Organization, the World Bank Group, and the Organization for Economic Co-operation and Development use the equivalent of DNL 55 dB as their criterion, or a yet lower level. Only the aircraft sector in the United States espouses a higher DNL criterion level.

One can ask why the aircraft sector might espouse a higher criterion level. One hypothesis is that for the same measured noise level, aircraft noise is perhaps 10 dB less annoying than road traffic, railroad or industrial noise.

This hypothesis is testable. Finegold *et al.* (Figure 7) shows community annoyance as a function of DNL separately for aircraft, road traffic, and railroad noise. His results show that for the same DNL, aircraft noise is more annoying than the other forms of transportation noise. Miedema and Vos (1998) have performed a similar analysis on an even bigger database (Figure 8) and find that for the same DNL, aircraft noise tends to be significantly more annoying than are other forms of transport noise. These studies by Finegold *et al.* and by Miedema and Vos use virtually all the available noise attitudinal data collected worldwide during the last 50 years. Thus, on the basis of the large world body of scientific data, the correct criterion for aircraft noise should probably be lower for aircraft noise than for other noise. For this reason, the recently approved ISO Draft International Standard on this subject (ISO, 2000) recommends a 3 to 6 dB penalty for aircraft noise compared with road traffic noise. So one can conclude that aircraft noise, for the same DNL, more annoying than is other transportation noise. One cannot claim that a higher criterion level for aircraft noise is justified on any scientific basis.

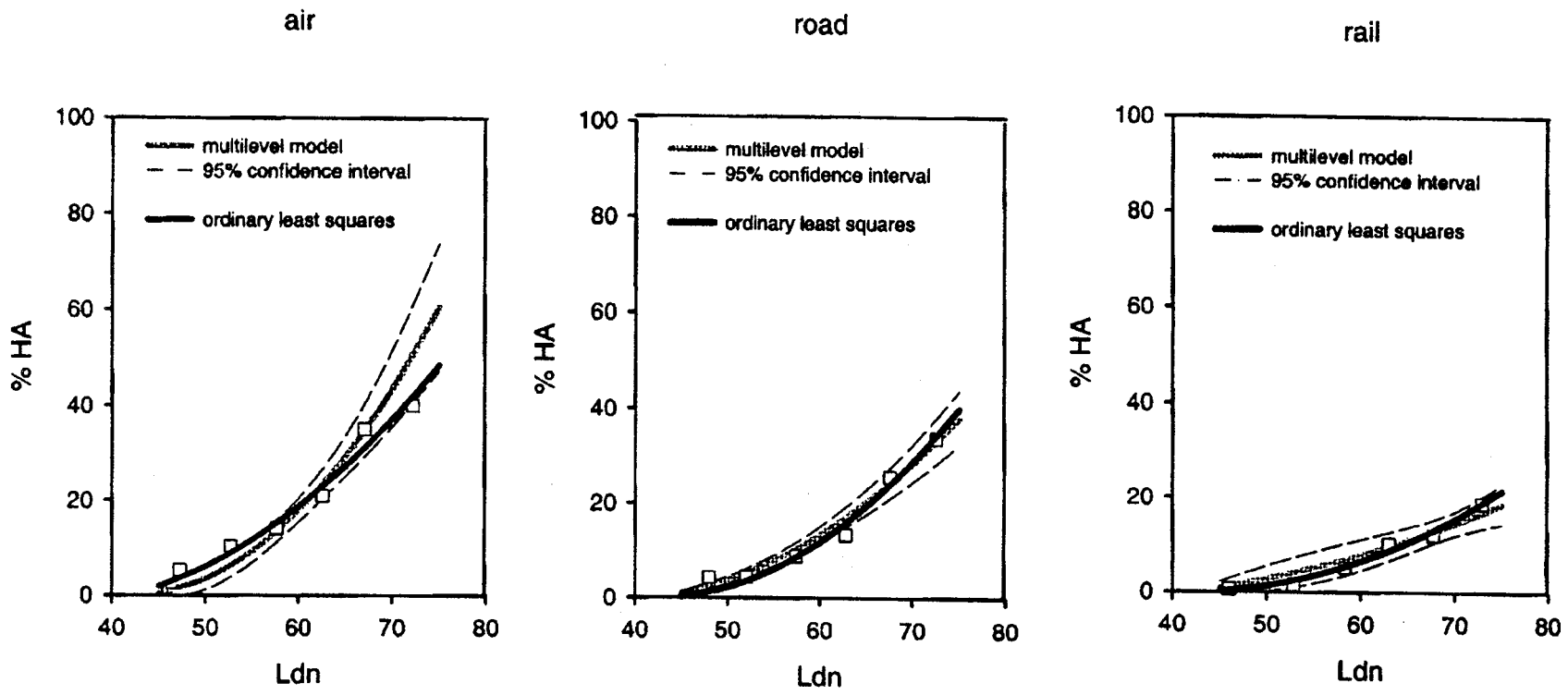

Figure 7. A recent meta-analysis of noise annoyance versus sound level by Miedema and Vos (1998) using all applicable world-wide noise attitudinal survey data.

V. CONCLUSIONS

1. Nearly all agencies and boards, standards setting bodies, and international organizations that have cognizance over noise producing sources use a DNL criterion value of 55 dB as the threshold for defining noise impact in urban residential areas. In fact, of this large number of agencies, boards, standards setting bodies, and international organizations, only the Department of Defense and the Federal Aviation Administration suggest a criterion value for DNL that is higher than 55 dB.

2. The policies of FAA/DOD (and HUD) all were developed in the early 1970's and earlier (e.g., HUD, 1971). In contrast, most of the agencies and boards, standard setting bodies, and international organizations have established their policies after 1995. In particular, the World Health Organization recommendations (WHO, 1999) are based on over 25 years more worldwide research into noise effects than are the earlier FAA/DOD policies.

3. Significant evidence exists to suggest that aircraft noise is more annoying than is road traffic noise for the same DNL level.

4. Of all of the boards and agencies, standards setting bodies, and internationals organizations, one should consider the World Health Organization and the National Research Council as the primary authorities on acceptable levels of pollutants. They are charged with developing this type of scientific position and have clearly spoken. WHO terms DNL 55 dB as engendering serious annoyance and creating an unhealthy environment, and WHO terms DNL 50 dB as engendering moderate annoyance. The NRC goes further, and, in many instances, recommends assessments when the project noise exceeds a DNL 40 dB.

5. No single DNL criterion is equally applicable to all residential situations and all types of residential communities. A sizeable number of agencies and boards, standards setting bodies, and international organizations that have cognizance over noise producing sources recommend a DNL criterion value that is less than 55 dB as the threshold for defining noise impact in sparse suburban and rural residential areas. Rural areas require a criterion that is 10 dB lower than the criterion used in normal urban areas.

6. For residential areas and other similarly noise sensitive land uses, noise impact becomes significant in urban areas when the DNL exceeds 55 dB. In suburban areas where the population density is between 1250 and 5000 inhabitants per square mile, noise impact

becomes significant when the DNL exceeds 50 dB. And in rural areas where the population density is less than 1250 inhabitants per square mile, noise impact becomes significant when the DNL exceeds 45 dB.

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Annex A: OTHER COMMON SOUND LEVEL METRICS

Maximum Sound Level (Lmax)

The highest sound level measured during a single event in which the sound level changes value as time goes on (e.g., an aircraft overflight or a truck driveby) is called the maximum sound level. It is usually abbreviated by Lmax. Two different time periods may be used to determine Lmax: 0.125s (fast response) or 1.0 s (slow response). The "A" frequency weighting typically is used with Lmax and is identified as LAmax.

Peak Sound Pressure Level (Lpk)

The peak sound pressure level, Lpk, is the highest instantaneous level obtained by a sound level measurement device. The peak sound pressure level is typically measured using a 20 μs or faster sampling rate. Lpk is typically based on unweighted or linear response of the meter.

Sound Exposure Level (SEL)

Individual time-varying noise events have two main characteristics: a sound level which changes throughout the event and a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant: The longer the event, the more intrusive it will be. The Sound Exposure Level (abbreviated SEL) combines both of these characteristics into a single metric. It has the physical units of pressure-squared multiplied by duration (time).

Note that sound exposure level is a composite metric that represents both the intensity of a sound and its duration. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that Sound Exposure Level measures this impact much more reliably than just the maximum sound level.

Sound Exposure Levels are usually A-weighted (ASEL). Because the Sound Exposure Level and the maximum sound level are both expressed in decibels, there is sometimes confusion between the two, so the specific metric used should be clearly stated.

Equivalent Level (LEQ)

Equivalent level is a measure of the sound energy average over a stated time period, e.g. one hour. The equivalent level (LEQ) is formed from the sum of the sound exposures of each truck drive by, or each plane flyby, divided by the time period in seconds. For example, if the time-period is one hour, then the divisor is 3600 seconds. This quotient is then converted to its decibel quantity. LEQ usually is A-weighted (ALEQ).

APPENDIX E

Figure 25 of GAO Report (August 2000)

United States General Accounting Office

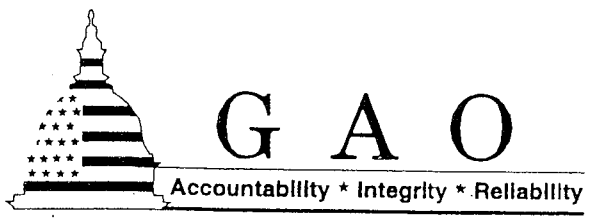
GAO

Report to Representative James L. Oberstar, Ranking Democratic Member, Committee on Transportation and Infrastructure, House of Representatives

August 2000

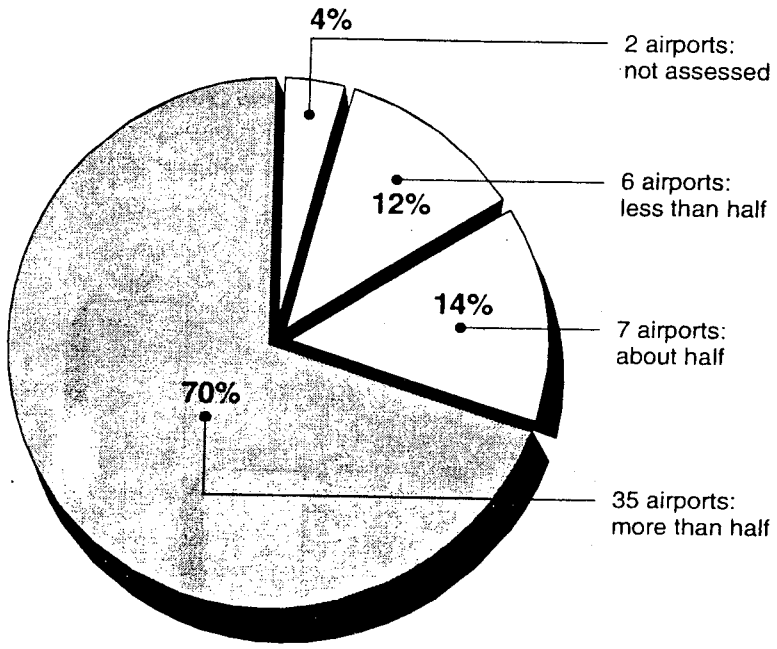
AVIATION AND THE ENVIRONMENT

Results From a Survey of the Nation's 50 Busiest Commercial Service Airports



GAO/RCED-00-222

Figure 25: Portion of Airports' Noise Complaints That Come From Areas Outside the 65 dB DNL Contour



Note: Two airports have not calculated the portion of noise complaints that came from areas outside the 65 dB DNL contour.

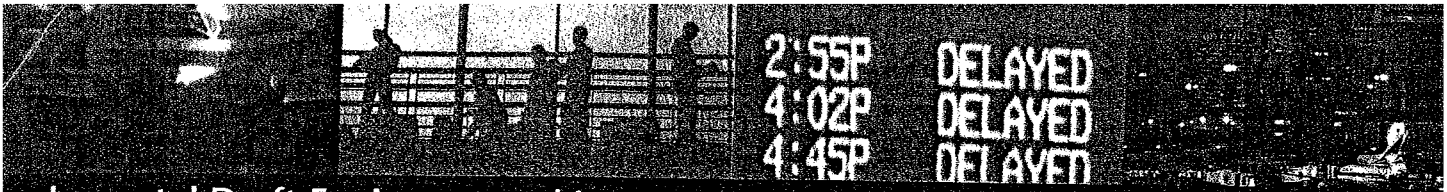
Source: GAO's survey of the nation's 50 busiest commercial service airports.

28. Approximately how often does your airport monitor noise levels?

Officials at over half of the airports monitor noise daily or more often, and officials at almost all airports monitor noise at least periodically. (See fig. 26.) An official from one airport reported that the airport does not monitor noise.

APPENDIX F

Minutes of September 27, 2000
SDEIS Panel



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EOEA #10453

Logan Airside Improvements Planning Project

Boston Logan International Airport

massport Massachusetts Port Authority

Federal Aviation Administration

Appendices
Volume 3

Boston Logan International Airport
Supplemental Draft EIS (SDEIS) Panel

Draft Minutes
September 27, 2000

I. Agenda (See attached)

II. Participants: All panelists were present.

III. Discussion

Opening Remarks, Review of Minutes, Updates

- The meeting opened with a review of the agenda. The facilitator noted that the focus of this meeting would be on concluding the discussions of delays at Logan, and beginning the discussion of environmental impacts.
- Mr. Scarano updated the Panel on several items.
  - He communicated Mr. Egan's questions about accelerating the Panel process to FAA Director, Jane Garvey, and received no indication from her of any need to accelerate the process. He also requested information for the panel about how the national summit on delay relates to the Panel's work, and is awaiting a briefing paper which he will distribute.
  - Mr. Scarano clarified that the summary of comments and responses to the DEIS sections on noise that were distributed to Panel members had not been updated since the Panel began meeting, and therefore should not be expected to include any ideas discussed in Panel meetings.
  - Mr. Scarano distributed copies of letters regarding Shuttle America's proposal to serve Laguardia Airport from Hanscom. He noted that Mr. Rushing had requested copies of these letters, and that he was providing them to all panelists, as required by the groundrules. In the discussion of the topic of these letters, consultation with the State Historic Preservation Office (SHPO), a question arose about the consultation with SHPO on the Airside Improvements Project. John Silva from FAA stated that section 106 coordination was completed as part of the Airside DEIS. Information was provided to the SHPO, including noise contours and identification of historic properties, and the SHPO had found no historic resources were unduly impacted. Mr.Rushing mentioned that Congressman Moakley had requested a review of this finding in a letter to the FAA.
- The minutes for Sept. 6 were reviewed. A typo was corrected, as was a statement of Mr. Scarano regarding a regional airport coordination meeting. Mr. Rushing asked a follow up question to an item in the minutes about Mr. Scarano's attending the Sept. 18 CAC meeting. He asked if there were minutes from that meeting. During Public Comment, Anastasia Lyman, Chair of the CAC, noted that there are minutes that could be made available to the Panel after they are finalized.
- Ms. Welch submitted a list of written questions and concerns from several community groups. She also noted that community members from the town of Winthrop have asked

the Panel to delay finalizing the SDEIS until after completion of a study of health effects from the airport on citizens of several neighborhoods in Winthrop. Mr. Scarano noted that the information about the study could be submitted during the public comment process on the SDEIS. Mr. Egan spoke against the need for the Panel process to be delayed. Mr. Tye noted the need to have as much information as possible for the ROD, and Mr. Rushing noted that if the information would improve the SDEIS, it should be reviewed. The duration and completion date of the study are not known, but will be researched prior to the next meeting.

Congestion at Logan Airport and Potential Remedies: Presentation by Professor Amedeo Odoni.

- Amedeo R. Odoni, T. Wilson Professor of Aeronautics and Astronautics at MIT, provided a briefing to the panelists based on his academic experience, nationally and internationally, evaluating delay and delay reduction at airports. He noted that there is no question that Logan is a seriously congested airport, with about 100,000 hours of delays per year. This level of delay represents about $150,000,000 in costs to airlines and $150,000,000 in costs to travelers. He outlined three potential solutions for the short term: Runway 14/32, peak-period pricing, and improvements in Air Traffic Control (ATC). He agreed with the delay reduction projections for the runway presented by other consultants, but noted that projected delay reduction benefits may be reduced by the switch from turboprops to regional jets. He further explained that for peak-period pricing, a small number of flights could result in a large decrease in delays. For example, a one per cent reduction in flights, could reduce delays by 7%. He noted that demand by non-jets at Logan has been reduced from 1993 to 1998, and that the 1998 demand is flatter over the day. He suggested analyzing the reasons for this change as part of the SDEIS analysis. Regarding ATC improvements, Dr. Odoni felt that their benefit at Logan is minimal - perhaps 5-10% - because of the complex geometry at the airport. He summarized his suggestions for further analysis as follows:
    - Determine if regional jets will use Runway 14/32 in sufficient numbers to achieve projected delay reductions.
    - Define and examine how 14/32 could be used in IFR, in addition to the VFR conditions.
    - Analyze why hourly demand changed between 1993 and 1998 to obtain information that may help design effective demand management.
- Professor Odoni noted that the medium and long-term solution for Logan airport is to develop a coordinated regional airport system because demand will eventually continue to exceed capacity, even with improvements. This will require Logan to make some tough decisions about its most appropriate role in the regional system. He reiterated that the outlook for Logan to improve in delays is bleak, and that the eventual capacity is probably limited to 550,000-580,000 operations. With current operations at 510,000, there is only room for 10% growth, which is much lower than the amount by which unconstrained demand might increase over the next 10-20 years.
- Lt. Governor Swift asked Professor Odoni what he saw as the major constraints to the development of a regional system. He responded that institutional constraints are the most obvious, and that the airports need to feel they have stakes in each others'

success. He further noted that the process of making choices about Logan's specific role in the regional system would also be difficult.

- Mr. Rushing asked what the definition of capacity is at Logan. Mr. Odoni said it is the number of operations per hour that can be accommodated without violating ATC constraints. For Logan this is 120 operations per hour in VFR.
- Mr. Tye asked how many hours of the 100,000 hours of delay are perceived by the consumer. Professor Odoni noted that Logan is perceived as a very unreliable airport by consumers, whether or not they perceive the hours of delay with each flight.
- Mr. Scarano asked whether and to what extent federal and state laws impede collaborative planning among airports. Professor Odoni said they play a large role. For example, recent federal legislation that says only planes with under 71 passenger can be added to Laguardia makes little sense and goes in the opposite direction to what should be happening there.
- Mr. Scarano asked if there are examples of integrated airport systems elsewhere. The response was that London's three airports are operated in a coordinated manner, and that Amsterdam and Brussels are coordinated. The mechanisms for encouraging coordination do not necessarily have to be regulations; price incentives on gates and fees for passenger use of terminals can also be used to create appropriate incentives.
- Mr. Tye asked if Runway 14/32 would restrain the growth of delays at Logan. Professor Odoni said it would under NW wind VFR conditions, and possibly in IFR conditions. The delay reduction will be temporary, because additional demand will fill in, but that increase in demand would occur anyway and would create worse problems without Runway 14/32.
- Ms. Welch asked about the suggestion to use runways 32 and 33 in parallel in IFR conditions. She suggested that the simultaneous approaches would create more noise, especially when planes approach over land rather than the required over-water approach. Professor Odoni noted that the least environmental impacts are from approaches on runways 33 and 32, if the flights adhere to the flight paths.
- Ms. Welch asked why the changes in the fleet mix to include regional jets might reduce delay reduction benefits from the runway, asking if the difference between what the aircraft manufacturers say is sufficient runway length and what pilots feel is sufficient is a factor. Professor Odoni agreed with this reasoning, noting that pilots may reject the 5000 foot runway, as they have objected to Land and Hold Short procedures.

<u>Overview of Noise Impacts from Airside Improvement Project</u> - Bob Miller, HMMH

- Bob Miller of HMMH presented an overview of the analysis conducted for the DEIS of noise impacts from the Airside Improvement Project. He explained the DNL metric and the use of 65 DNL as an FAA guideline of residential land use compatibility. He described current and past noise rules at Logan, and the soundproofing insulation program. He reviewed the noise contours in the DEIS, noting that fewer people will be exposed to the highest level of noise - 75 and 70 DNL - and that there would be a slight increase in noise within the 65 and 60 DNL. He outlined mitigation measures to address these impacts, including noiseproofing and PRAS monitoring to improve the distribution of the noise across neighborhoods.

- Ms. Welch noted that even at levels lower than 65 DNL, the aircraft noise is irritating and distracting. Mr. Miller noted that 65 DNL is the cut-off for federally funded soundproofing, but it does not mean that those at 64 DNL have no impacts. He further mentioned that EPA has identified 55dB as being of concern, and that studies have found that in 55dB areas, 17% of the population experience annoyance.
- Mr. Tye asked at what dB level conversation would need to stop. The response was around 60-65.
- Ms. Welch noted that assumptions about how often planes fly over water are not borne out in practice. She also noted that if 14/32 is built, flights off of runway 27 will triple, and that needs to be factored into the impact assessment.
- Mr. Rushing asked why there are increases projected in exposed populations. Mr. Miller responded that take-offs and landings will be in different geographic areas with the new runway.
- Lt. Governor Swift noted that it would be useful to provide the Panel with a handout explaining what is included in the metric of DNL. She further noted that delays are irritating, just as airplane noise is, and asked if there was information available about the extent of annoyance caused to consumers by delays.

IV. Public Comment

- John Marcy, from Winthrop and a member of Winthrop's AIR Environment-Health Committee, presented the panelists with a copy of a letter to Jane Garvey explaining the upcoming study of health effects from the airport and requesting that the Panel not be concluded prior to the completion of the study.
- Anastasia Lyman, Chair of the CAC, noted the need for community involvement in the Panel's work, offered copies of the minutes of the recent CAC meeting to panelists, and asked that the Panel and public be provided with a copy of the recent Chicago O'Hare air quality study. She further noted that there is a need for new noise rules at Logan.
- Blossom Hoag asked that Ms. Welch's questions be placed on the web site, and that there be more outreach to the public. She further commented that she is surprised at the limited amount of discussion among the Panelists, and that the process seems to consist mostly of lectures by advocates for the runway.
- Steve Lathrop from Hull reminded the Panel that the south shore is affected by airport operations, and that over-the-water flights often affect Hull. He noted that some flights pass over Hull High School at 1500 feet.
- Mr. Pepper-Eisenberg, of Save Our Heritage, spoke in favor of peak-period pricing as an important part of the solution. He referenced Mr. Odoni's support for it, and also noted Mr. Odoni's statements that the runway is a temporary fix. He questioned why the runway is needed if it will be a short-lived solution. (Professor Odoni responded to this question after the meeting. See his note, attached.)
- Gerry Falbo from Winthrop noted that cumulative effects of additional operations did not correspond to the cumulative noise exposure described by Mr. Miller.

V. Scheduling and Planning for Next Meeting

- The Panel agreed to continue the discussion of noise and environmental justice at the next meeting, which was rescheduled to October 10.
- The Panel scheduled several additional meetings to accommodate its workplan. They are:

  October 10, from 3 to 5 PM
  November 13 from 3:30 to 6:00 PM
  December 4, from 4:00 to 7:00 PM
- The October 12 meeting previously scheduled will be held as a reserve date in case the discussion of October 10 is not completed, and would be held with only four panelists present if it did go forward.
- The December 4 meeting will be focussed on Panel review of a proposed outline for the draft SDEIS, and will be the final meeting before the SDEIS is developed.

VI. **The meeting adjourned at 7:05 PM.**

APPENDIX G

The Importance of Peak-Period Pricing at Logan, Steven Morrison & Clifford Winston (May 2001)

THE IMPORTANCE OF PEAK-PERIOD PRICING AT LOGAN AIRPORT

Steven A. Morrison **Clifford Winston**

May 2001

This report contains confidential work product subject to attorney-client privilege.

Summary

The Massachusetts Port Authority is considering an airside improvement project that involves building a new runway at Boston's Logan International Airport. The case for building this runway and estimates of its effects are contained in various reports including *Logan Airside Improvements Planning Project supplemental DEIS/FEIR* (relevant sections in chapters 3 and 4), *Logan Airside Improvements Feasibility Study* (July 1995), *Logan Airside Improvements Planning Project Boston–Logan International Airport* (Massachusetts Environmental Notification Form, July 1995), and *Logan Airside Improvements Planning Project* (Volume 1, Draft Environmental Impact Statement, February 1999).

We have been retained by Baker, Braverman & Barbadoro, P.C. to render our opinion on the soundness of these reports with regards to their treatment of peak-period pricing as a viable strategy for addressing capacity problems and delays at Logan. It is our view that these reports have not given appropriate consideration to congestion pricing as a critical strategy to reduce delays at Logan. The preferred alternative recommended in these reports—build the runway first and then introduce peak-period pricing if conditions warrant—is not consistent with accepted economic efficiency guidelines for maximizing the social net benefits from a public project. The policy that *is* consistent with accepted efficiency guidelines is to first set optimal take-off and landing congestion charges for all aircraft and then determine, based on cost-benefit grounds, whether it would be desirable to build an additional runway.

Problems with the Logan Airside Improvements Planning Project SDEIS/FEIR

There are several problems with the SDEIS/FEIR recommendation of building the runway first and then introducing peak-period pricing if conditions warrant. To begin, principles of project evaluation for public projects (sometimes also known as cost-benefit analysis) identify optimal pricing and investment as key components for efficient management of public projects such as airport infrastructure. Each component has a critical role. Optimal pricing ensures that the airport is not over or under used by making each user pay the additional cost of serving them. With optimal pricing, one can then assess how much additional capacity users are willing to pay for. The investment decision should be based on cost-benefit analysis, which implies that the efficient size of the public facility is where the extra benefit of an additional unit of investment is equal to the extra cost of the additional investment.

This conceptual framework is extremely relevant for airport projects. It indicates that efficient management of airport capacity calls *first* for the authority to institute efficient (congestion) pricing and then decide on cost-benefit grounds whether it is desirable to build an additional runway. Thus pricing serves as a "signal" for efficient investment. Without efficient pricing in place, it is possible for an airport to make inefficient investments in runways. For example, if landing fees in the peak period are set too low, then the airport will be more congested than if landing fees were set higher to reflect congestion costs, making it appear that new capacity is warranted, when, in fact, it may not be. The reports recommend that pricing be considered *after* the runway is built. This is an incorrect sequencing of policies to expand the capacity of Logan airport.

The reports seem to justify their approach by suggesting that peak-period pricing only makes sense when there is "overscheduling." Congestion pricing and runway investment are designed to "expand" airport capacity. It is difficult to understand why runway investment would be a successful strategy under certain conditions of aircraft demand, but that congestion pricing would not be successful under these same conditions. The argument for an additional runway is that it would provide benefits by reducing delays. That is, more takeoffs and landings can be accommodated at the airport during a given hour. Congestion pricing reduces delays by spreading out demand for the use of the airport throughout the day and reducing demand on peak period capacity. Because *fewer* aircraft wish to use peak period capacity when faced with congestion charges, capacity is made available for those aircraft that are willing to pay the higher fees. In return, such aircraft experience less delay. To repeat, if delay can be reduced by building a new runway, it can also be reduced by setting efficient congestion prices.

There is an important difference between congestion pricing and runway investment—congestion pricing does not cost very much to implement. In fact, it would be a fairly simple matter to replace current weight-based fees with takeoff and landing congestion charges during peak periods and with lower charges during off-peak periods (to achieve revenue neutrality). Runway investment, however, is costly and takes time. The reports do not clearly indicate these costs. Although the reports set up various alternatives and recommend building a runway as a preferred alternative, they mislead because the alternatives are *not* evaluated according to cost-benefit criteria, which is the accepted way

to choose among competing alternatives. Including costs and benefits could make the preferred strategy less desirable than the congestion pricing alternative.

The SDEIS/FEIR suggests that although peak-period pricing does produce delay savings, they are less than building a runway (see, for example, table 4.7-2 on page 4-75 in the Supplemental DEIS/FEIR report). This is also misleading because of the sequencing of decisions. If pricing were implemented first, followed by runway investment, the benefits from pricing would be higher than if the sequencing were done in reverse. That is, the marginal benefits from reduced delay from pricing are less after a runway is built than before a runway is built. Even where analysis calls for both pricing and investment, efficient prices should be the first policy put in place.

One advantage of peak-period pricing in the Logan case is that its predicted effects are not likely to be subject to fleet mix. To a first approximation, commercial jets delay traffic as much as general aviation, thus congestion fees would not have to change if Logan experiences a change in its fleet mix. But runway investment can be sensitive to changes in fleet mix. In the present case, Logan has proposed a 5,000 foot runway expecting general aviation and commuter planes to use it, thus reducing delay. While the runway has been under consideration, there has been a change in the fleet that uses Logan replacing turboprops with regional commercial jets that are too large to use the new runway. In this case, the benefits from the new runway are over estimated because fewer planes would be using it than were originally predicted.

Finally, Massport's SDEIS/FEIR does not include any technical foundations for its findings and conclusions regarding its decision to build the runway instead of implementing peak-period pricing. The report claims to have analyzed peak-period pricing and its effects, but it is not clear how this was done. Peak-period pricing should amount to optimal congestion charges, which in turn depend on the value of passengers travel time, the demand for the airport, the sensitivity of demand to the takeoff and landing charges, and the ease of passengers and airlines to fly at different times of day or to different airports. None of these parameters and their values were included in the reports. Moreover, the conceptual basis for peak-period pricing and how prices were constructed was not discussed, so it is impossible to assess accurately what the findings are actually measuring. Similarly, without a detailed description of the model, its parameters, and assumptions, it is impossible to assess accurately the findings on the effects of building a new runway, including what, if any, delay reduction benefits a new runway would provide.

Conclusion

The conclusion of Massport's SDEIS/FEIR is that Logan should build a new runway to relieve delays. We are troubled by this recommendation because we have found it impossible to assess accurately the technical work that led to this conclusion. To the extent we have been able to assess what was done, we find that the proposal to build a new runway is at variance with accepted knowledge about efficient airport infrastructure policy, which calls for efficient congestion prices to be the first policy that Logan pursues. Indeed, we conclude that peak-period pricing, not a new runway, should be

Massport's preferred alternative for immediate, cost-effective, delay-reduction at Logan airport. We stress that there are no legal impediments to implementing a policy of peak-period pricing (for further discussion of this point see Dorothy Robyn, "Congress' Plan to Reduce Flight Delays is not Airworthy," AEI-Brookings Joint Center for Regulatory Studies, *Policy Matters* 01-15, May 2001).

APPENDIX H

Current Noise Levels Generated at Hull by Logan Airport, Paul Schomer (May 31, 2001)

SCHOMER AND ASSOCIATES

CURRENT NOISE LEVELS GENERATED AT HULL BY LOGAN AIRPORT

May 31, 2001

Paul Schomer

Schomer and Associates

Champaign, IL 61821

CURRENT NOISE LEVELS GENERATED AT HULL BY LOGAN AIRPORT

May 31, 2001

I. INTRODUCTION

1. Background

a. Measurements

The most fundamental way to assess noise is to measure it. Simply stated, if one wishes to know what the noise level is, one can set out a meter and measure it. However, nothing is ever quite as simple as it seems. In the case of noise measurement, one must insure that only the source in question is measured. For example, if traffic noise and aircraft noise exist jointly, it may not be possible to directly measure just the aircraft noise. Also, one must measure long enough to capture and sample the full range of activities of the noise source in question in an unbiased fashion.

Boston's Logan Airport maintains an unattended noise monitor on the Hull peninsula by the Hull high school. Figure 1 shows the approximate position of this monitor and Figure 2 is a photograph of the monitor with the high school in the background.

The total yearly average DNL measured by this monitor has been published by Logan Airport. However, these published levels include all noise and not just airport noise. The Hull site is acoustically well situated. It is far from busy roadways, industrial noise sources, and other sources of acoustical noise. However, wind noise and wave noise contribute to the noise measured by this monitor. A companion document, Assessment of Airport Noise Monitoring at Hull, shows that the airport noise is approximately 2 dB less than the total noise measured by this monitor. This value, 2 dB, is used to convert the total noise levels to airport only noise levels. Nearly all of the "extra" 2 decibels results from wind and wave noise.

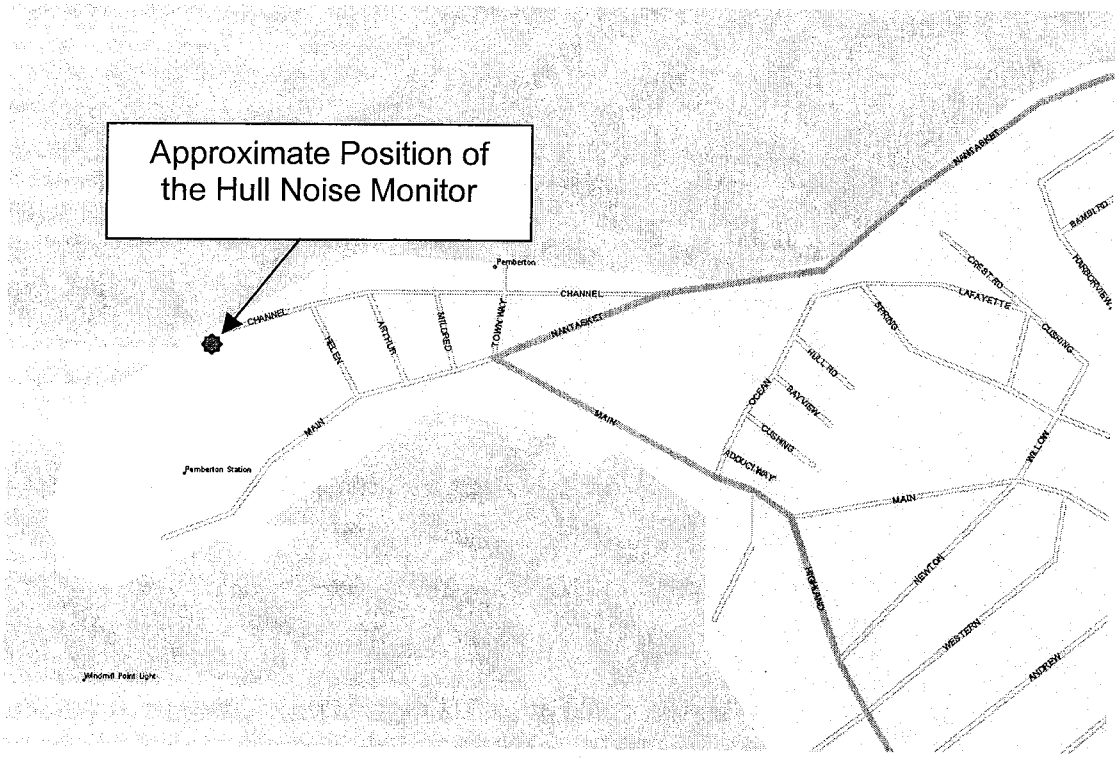

Figure 1. Approximate position of the Logan noise monitor at the tip of the Hull peninsula

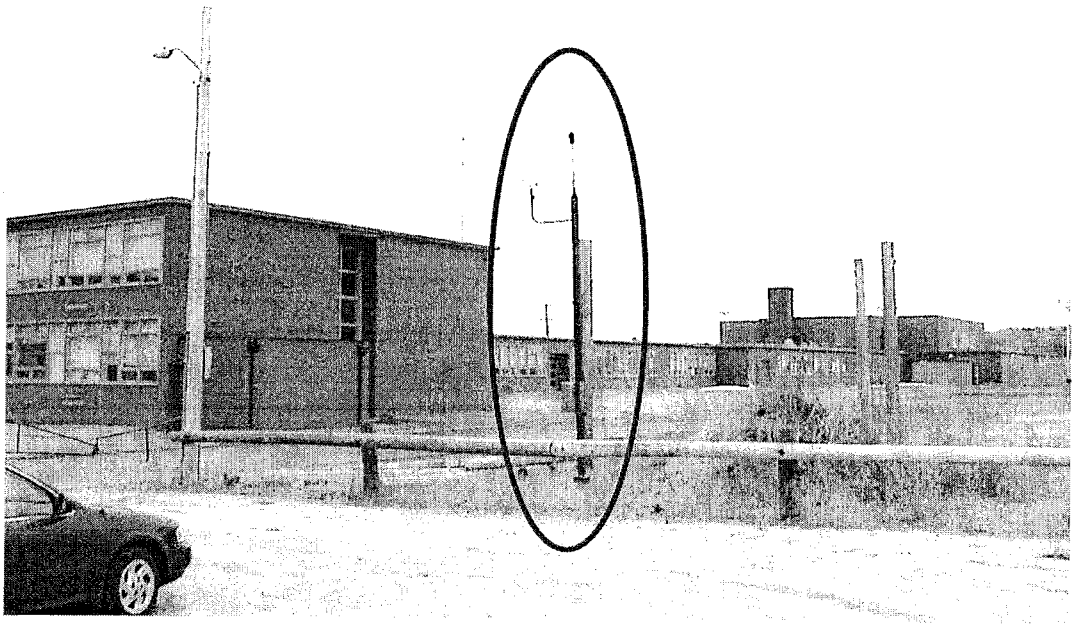

Figure 2. The Hull noise monitor looking towards the high school

b. Modeling

A second way to assess the noise is to model the situation. Computer simulations are used to predict the noise based on physical models that predict the noise source emissions and sound propagation from source to receiving point based on the physical parameters of the site and on the physical operations and position of the source. Modeling is the only way to assess a future source that does not currently exist. Further, it is the only practical way to assess noise in a wide area such as around an airport or along a highway. One simply cannot afford to measure continuously in hundreds or thousand of locations.

Like direct measurement, computer simulations using models are not perfect. There can be many sources of error. Examples of error sources are the physical description of the source, the position of the source, the power settings and other operating parameters of the source, and the physical description of the sound propagation based on actual sound velocity distributions, sound absorption by the atmosphere, land surface terrain and features, and the surface acoustical impedance.

c. Modeling versus Measurement

The question of modeling versus measurement is one of accuracy—which method is more accurate. In general, modeling is more accurate than one day or few days of measurement. However, continuous measurements or sampled data from 12 to 24 days throughout the year are more accurate than computer simulations (ANSI, 1992). Thus, in California, by state regulation, computer modeled airport noise contours are adjusted based on the results of continuous airport noise monitoring. And, as discussed below, Logan has chosen to go to the FAA and make changes to INM when predictions differed substantially from their continuous measurements.

2. Purpose

The purpose of this paper is to document current and historical airport noise levels by the Hull noise monitor and to discuss possible errors in the modeling that may contribute to the differences between the measurements and computer simulation results at the Hull monitor.

II. CURRENT AIRPORT NOISE LEVELS AT HULL

Table 1 gives the monitor measured total noise at the Hull monitor by year for the last 10 years.[1] Column 3 in Table 1 gives the estimated airport noise by year, the total noise minus 2 decibels (Schomer, 2001). Obviously, the level in 1991 is much larger than are the levels for any other year. Because 1991 is so different and so far in the past, it is not included in the present analysis. Rather, Table 1 includes an energy average of the levels for 1992 through 2000. But further examination of the data suggest that in 1994 the airport transitioned and that DNL levels dropped from about 65 dB in 1992 and 1993 to about 63.5 dB. The total measured noise levels have been virtually constant since 1995 at about 63.5 dB. This implies that the current airport noise DNL at the Hull monitoring site is 61.5 dB.

Table 3 also shows that the yearly DNL appears to correlate with airport operations. Takeoffs over Hull use Runways 22IL/22R and landings over Hull use Runway 33L. Takeoffs on Runways 22L/22R drop in 1994, and 1991 is a high year for both takeoffs and landing on 33L.

Year	Total DNL	Airport DNL	Percent Turbojet Departures on 22L/22R	Percent Turbojet Arrivals on 33L
2000	63.8	61.8	34*	25*
1999	63.2	61.2	34	21
1998	63.2	61.2	33	19
1997	63.7	61.7	37	20
1996	63.6	61.1	39	18
1995	63.7	61.7	34	17
1994	64.1	62.1	34	19
1993	65.7	63.7	43	15
1992	65.0	63.0	40	17
1991	72.0	70.0	42	25
Energy Average, 1992-2000		62.1		
Energy Average, 1995-2000		**61.5**		

* Three month estimate

Table 1. Total measured DNL and airport noise only DNL at the Hull monitor for the years indicated.

[1] Data published by Logan Airport.

III. ANALYSIS OF COMPUTER SIMULATIONS VERSUS MEASUREMENTS

1. Systematic Biases

Table 2 contains the Logan measured airport only DNL versus computer predictions for 1998 and 1999.[2] Based on these data, Table 3 contains the two-year averages and the difference between measurements and predictions. The data in Table 3 have been sorted by measured DNL level and grouped into low, middle, and high DNL groups. An average difference between measurement and prediction is indicated for each of these three groups. These average differences by group are summarized in Table 4.

Average Airport Reported Airport Only Measured DNL Range	Average Difference Measurement Minus Prediction
68 to 78 dB	0.2
58 to 68 dB	1.0
48 to 58 dB	3.1

Table 4. Measured DNL range versus the quantity "measurement minus prediction."

Table 4 shows that the differences between DNL measurements and predictions are not random. Rather, there is a systematic bias that increases with decreasing DNL. One can speculate that the lower DNLs represent more distant sites. The INM is known to underestimate at longer distances—especially to the sidelines. This table merely confirms one known bias in the present INM. The difficulty lies in the sound propagation algorithms that, at present, are quite old and outdated.[3] The conclusion is that, at Hull, one decibel of the difference between prediction and measurement is the general downward bias of INM in this range.

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[2] A companion report shows, at least in the case of Hull, that these airport only DNL levels are low by about 2 decibels.

[3] INM sound propagation algorithms are currently under revision by the Society of Automotive Engineers A-21 Aircraft Noise Committee.

	Monitor	Area	1999 Aircraft Only DNL	1999 INM Prediction	1998 Aircraft Only DNL	1998 INM Prediction
1	Andrews St.	South End	61.8	58.4	61.8	58.7
2	B band Boldton	South Boston	66.0	66.4	66.1	66.7
3	Day Blvd, near Farragut	South Boston	65.3	64.4	65.1	64.5
4	Bayview and Gradview	Winthrop	77.3	78.9	79.8	79.4
5	Harborview and Faun Bar	Winthrop	69.4	70.4	70.6	71.4
6	Somerset near Johnson	Winthrop	69.6	67.7	69.9	68.2
7	Loring Road near Court	Winthrop	73.3	75.8	73.3	76.1
8	Morton and Amelia	Winthrop	66.5	67.0	67.0	67.5
9	Bayswater near Annavoy	East Boston	74.5	72.4	75.3	72.4
10	Bayswater near Shawsheen	East Boston	68.1	66.0	69.4	66.3
11	Selma and Orient	East Boston	64.5	62.4	64.8	62.2
12	East Boston Yacht Club	East Boston	71.5	73.8	71.1	74.0
13	East Boston High School	East Boston	65.0	64.3	65.6	64.2
14	Jeffries Point Yacht Club	East Boston	63.8	64.3	64.6	64.9
15	Admiral's Hill	Chelsea	64.1	61.4	63.3	61.1
16	Bradstreet and Sales	Revere	71.1	69.7	70.8	69.0
17	Carey Circle	Revere	61.9	58.9	62.3	58.3
18	U.S.C.G Recreational Facility	Nahant	55.2	49.0	55.2	49.8
19	Smith Lane	Swampscott	48.4	45.4	49.2	45.7
20	Pond and Towns Court	Lynn	54.3	50.5	53.6	49.5
21	Tremont near Prescott	Everett	55.4	55.1	54.8	53.8
22	Jagoun near Thatcher	Medford	54.7	49.2	52.6	49.4
23	Myrtlebank near Hilltop	Dorchester	57.4	51.7	57.7	52.0
24	Cunningham Park near Fullers	Milton	54.5	51.3	55.5	51.9
25	Squaw Rock Park	Quincy	49.5	50.7	51.0	51.2
26	Hull High School near Channel St.	Hull	58.9	58.3	59.2	58.1
27	Boston Latin Academy	Roxbury	60.0	58.4	60.4	58.8
28	Lewenburg School	Mattapan	55.6	53.8	55.1	54.0
29	Piers Park	East Boston	59.5	61.6	59.9	62.2

Table 2. Airport reported aircraft only DNL measurement versus INM prediction by site and year.

	Monitor	Area	Average Aircraft Only DNL	Average INM Prediction	Average Difference	Group Average Difference
4	Bayview and Gradview	Winthrop	78.6	79.2	-0.6	
9	Bayswater near Annavoy	East Boston	74.9	72.4	2.5	
7	Loring Road near Court	Winthrop	73.3	76.0	-2.7	
12	East Boston Yacht Club	East Boston	71.3	73.9	-2.6	
16	Bradstreet and Sales	Revere	71.0	69.4	1.6	0.2
5	Harborview and Faun Bar	Winthrop	70.0	70.9	-0.9	
6	Somerset near Johnson	Winthrop	69.8	68.0	1.8	
10	Bayswater near Shawsheen	East Boston	68.8	66.2	2.6	
8	Morton and Amelia	Winthrop	66.8	67.3	-0.5	
2	B band Boldton	South Boston	66.1	66.6	-0.5	
13	East Boston High School	East Boston	65.3	64.3	1.1	
3	Day Blvd, near Farragut	South Boston	65.2	64.5	0.7	
11	Selma and Orient	East Boston	64.7	62.3	2.4	
14	Jeffries Point Yacht Club	East Boston	64.2	64.6	-0.4	1.0
15	Admiral's Hill	Chelsea	63.7	61.3	2.5	
17	Carey Circle	Revere	62.1	58.6	3.5	
1	Andrews St.	South End	61.8	58.6	3.3	
27	Boston Latin Academy	Roxbury	60.2	58.6	1.6	
29	Piers Park	East Boston	59.7	61.9	-2.2	
26	Hull High School near Channel St.	Hull	59.1	58.2	0.9	
23	Myrtlebank near Hilltop	Dorchester	57.6	51.9	5.7	
28	Lewenburg School	Mattapan	55.4	53.9	1.5	
18	U.S.C.G Recreational Facility	Nahant	55.2	49.4	5.8	
21	Tremont near Prescott	Everett	55.1	54.5	0.6	
24	Cunningham Park near Fullers	Milton	55.0	51.6	3.4	3.1
20	Pond and Towns Court	Lynn	54.0	50.0	4.0	
22	Jagoun near Thatcher	Medford	53.7	49.3	4.4	
25	Squaw Rock Park	Quincy	50.3	51.0	-0.7	
19	Smith Lane	Swampscott	48.8	45.6	3.3	

Table 3. Two year averages sorted by airport reported aircraft only DNL. Average difference (measure minus prediction) for the three groups indicated. Note: each group is a 10 dB wide band.

2. Surface Effects (Grass versus Water)

It is well known that sound travels better over water than over land. This effect occurs because the ground provides a "soft" (low impedance) surface that is capable of absorbing much of the sound energies that impinge on it. In contrast, water, like concrete or ice, provides a "hard" (high impedance) surface that reflects most of the sound energies that impinge on it. The result is that the received sound level over ground, like a grass field, is lower than over water because the ground is absorbing much of the sound energies.

SoundProp (Schomer, 1994) is a computer model developed by the US Army Corps of Engineers based on over $1M of research on the physics of sound propagation. It is capable of modeling the sound as it travels from source to receiver over grass or water surfaces under a variety of wind conditions. SoundProp has been used to approximately model the attenuation of sound from an aircraft to the Hull noise monitor on takeoff from Runways 22L or 22R or on landing to Runway 33L. This modeling is for downwind (louder) conditions. The point of closest approach from the aircraft to the noise monitor has been modeled for both takeoffs and landings. SoundProp also has been used to model what the attenuation would have been in the same situation but over grass instead of water. The spectral differences between over water attenuation and over grass attenuation are the numbers to subtract from measured spectra in order to convert the monitor-measured date from over water (as measured) to what the would have been measured had the aircraft flown over land. Because physical predictions for single frequencies at fixed distances can yield large "dips" in the propagation, octave bands are used for this analysis. This helps to average over these dips that are average out with a moving source (like an aircraft) and usually are dissipated by turbulence in any real atmosphere.

The noise office at Logan was kind enough to supply a large sampling of data gathered by the Hull noise monitor along with ancillary airport data, and Appendix A contains these data for May 12, 2000. This appendix chronologically lists runway usage, wind conditions, and measured single-event sound levels (for sake of brevity, only the A-weighted sound exposure levels and the A-weighted maximum levels are included in the appendix—the spectral data are excluded). One can note that Runway 33L was in use (landings) from 00:35 to 05:44 and again from 07:47 to 09:34, and Runways 22L and 22R were in use (takeoffs) from 05:45 to 07:43 and again from 16:10 to 23:00. Many single events were measured by the Hull monitor during these times; only one event was registered during the time from 9:35 to 16:09 when landings or takeoffs were not

in the direction of Hull. Winds throughout the day averaged only 6 to 8 knots. The results for this day are two groups of aircraft takeoff data and two groups of aircraft landing data.

Figures 3 and 4 shows the energy-average noise spectra for landings and takeoffs, respectively, as measured by the Hull monitor on May 12, 2000 for the time periods indicated. Note that these spectra contain no evidence of a dip at around 500 Hz that is characteristic of propagation over land. This is further evidence that the received sound at the Hull monitor propagates over water. These spectra are used in conjunction with SoundProp calculations to predict the levels that would have been measured if the aircraft had flown over land instead of water. One interesting observation is that the takeoff and landing noise levels are about equal at Hull.

Table 5 lists the additional attenuation by octave band that can be predicted if the aircraft sound propagation were over grass instead of water.[4] There is a separate listing for takeoffs and for landing. The A-weighted level is calculated directly for the spectra in Figures 3 and 4 and for these four spectra attenuated by the respective takeoff or landing values in Table 5.

Table 6 contains the results. It shows that for both landings and takeoffs, over-water propagation is adding about 1 decibel to the levels.

	Time Period	
LANDINGS	00:35 to 05:30	07:49 to 09:30
Water	73.1	73.6
Grass	71.9	72.6
Landings Differences	**1.2**	**1.0**
TAKEOFFS	05:30 to 07:30	16:30 to 22:30
Water	72.9	73.2
Grass	71.9	72.1
Takeoffs Differences	**1.0**	**1.1**

Table 6. Calculated differences that would exist if the indicated operations had been over grass instead of water.

[4] Octave bands have been used to average over the dips created in this type of calculation using fixed frequencies and a stationary (non-moving) source without the dip-dissipating effects of turbulence

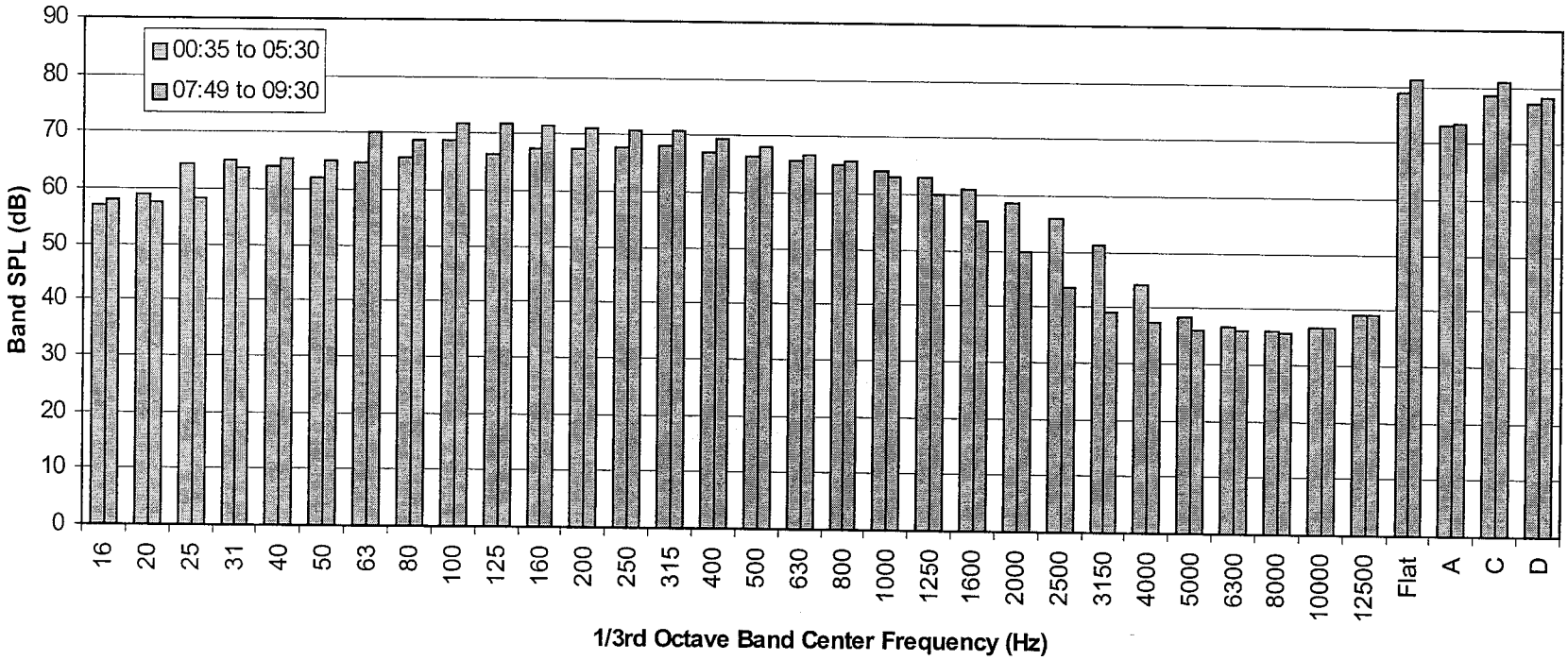

Figure 3. LANDINGS measured at the Hull monitor on May 12, 2000: Energy-average sound spectra for the time periods indicated

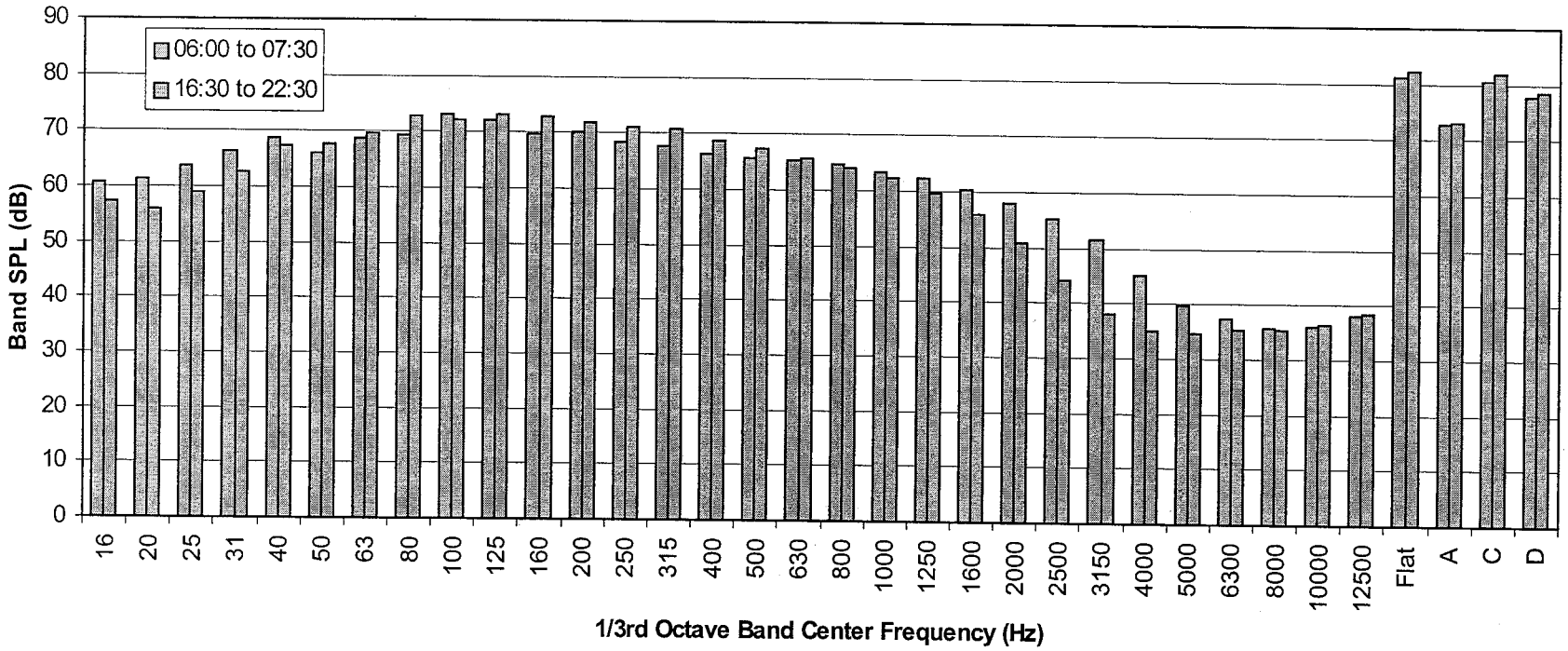

Figure 4. TAKEOFFS measured at the Hull monitor on May 12, 2000: Energy-average sound spectra for the time periods indicated

Octave Band Excess Attenuation Water minus Land	16	31	63	125	250	500	1000	2000	4000	8000
Takeoffs	-0.6	-1.0	-1.4	-2.5	-4.5	0.7	-1.9	0*	0*	0*
Landings	-0.2	-0.2	-0.5	-0.1	-0.5	-0.7	-2.1	-1.2	0*	0*

* Values set to 0 because predicted levels are too low to be reliable

Table 5. Octave band excess attenuation factors in decibels for operations over grass instead of water

3. Discussion

To its great credit, Massport is probably the only airport in the country to correct, at least in part, for sound propagation over water.

> "In 1993 measurements from the permanent [Massport] monitoring system were used to identify increased noise levels in shoreline communities caused by sound propagating over water rather than over ground as assumed in the FAA's standard noise model. Massport used the over-water data to petition the New England Region of the FAA to accept adjustments to the standard noise model. Approval was granted in 1994, leading to more accurate computations of noise exposure in neighborhoods bordering Boston Harbor." (Massport, 2000)

This over-water correction is used by Massport at the shoreline communities close to the airport where the over-water effect may be greatest. They are not currently used at Hull. However, at further distances like Hull, the effect may lessen, but the above calculations show that this over-water effect still is present. Thus, at least at the Hull monitor, the standard INM (an over-grass prediction) is contributing its least one decibel to the discrepancy between INM predictions and Massport measurements.

As indicated in (1) above, there are other systematic biases to the standard INM. For example, again to its great credit, Massport deals with another bias to the standard INM.

> "In 1998, Massport initiated a special study of terrain effects around Logan Airport. Results of noise measurements on Orient Heights indicated that high, steep terrain caused noise exposures on the hill to be higher than the FAA's standard noise model would predict. Thus, for a second time, Massport petitioned the FAA to accept the findings of a special study to alter the noise model, again improving the accuracy of noise contours at Logan Airport. Approval was granted in May 2000. No other airport in the US incorporates such unique considerations of terrain and water."

This ground altitude effect may be contributing a very small amount (perhaps 0.2 dB) to levels on the Hull hill that is about 100 ft above sea level. This effect, of course, is not present at the Hull noise monitor that is situated at sea level.

Remaining sound propagation and engine installation effects are still limiting the accuracy of INM—especially to the sidelines. Thus, the FAA is currently working with the Society of Automotive Engineers A-21 Aircraft Noise Committee to rectify this situation. For the present, the systematic bias between measurements and INM predictions at Logan appears to be contributing about 1 decibel to the difference between INM predictions and measurements at the Hull monitor (section 1 above).

III. CONCLUSIONS

1. It is concluded that the present airport only DNL at the Hull noise monitor is 61.5 dB. Further, this DNL level at the Hull monitor, 61.5 dB, has been virtually unchanged for the past 6 years, and the DNL was higher still in the years preceding 1995 (Table 1).

2. Systematic biases reduce DNL noise predictions using the INM. For this reason, Massport has twice petitioned and received permission from the FAA to alter the INM so as to correct for biases due to the surface under the aircraft (water) and due to the height of the noise receiver (hills).

3. The Massport corrections to INM for over-water propagation were not employed at distant locations like Hull. But the over-water correction contributes at least 1 decibel of error at Hull. That is, because of over-water propagation, the INM predicted levels at the Hull noise monitor are at least 1 decibel too small.

4. Systematic INM biases, likely due to propagation and engine installation effects—especially to the sidelines, are contributing at least 1 additional decibel to the discrepancy between INM predictions and Massport measurements at Hull and other sites where the Massport measured "airport only" DNL is between 58 and 68 dB.

5. The INM predictions made by Massport for the Hull monitor for 1998 and 1999 average about 58.2 dB. When the 2 decibels of correction described in Conclusions 3 and 4 above are added to this figure of 58.2 dB, it then compares reasonably well with the measured DNL of 61.5 dB.

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APPENDIX A
Single-Event Acoustical Data Measured by the Hull Noise Monitor and Corresponding Runway Usage and Winds

May 12 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
0:00:00						330	6			
0:00:00	4R	4L	15R							
0:35:00	33L		15R							
0:49:43									72.7	84.7
0:52:51									71.3	82
0:54:53									71.6	82.9
0:56:18									70.2	80.8
1:00:00						280	6			
1:00:23									70.5	81.1
1:13:29									70.2	81.1
1:20:19									70.2	80.3
1:26:15									79.7	90
1:45:39									69.6	80
1:55:33									70	77.9
2:00:00						280	7			
2:04:19									73.2	84.4
2:51:17									69.9	80.6
3:00:00						290	6			
4:00:00						290	8			
4:34:51									74	85
4:37:09									77.4	86.9
4:56:03									71.4	81.3
5:00:00						290	7			
5:42:08									74.2	83.3
5:44:02									74.1	84.5
5:45:00	27	22L	22R	22L						
5:48:33									71.7	81.4
5:51:28									73.8	83.8
6:00:00						280	6			
6:03:03									72.4	80.6
6:17:21									73.8	84.5
6:19:14									80.5	90.6
6:24:56									72.4	82.7
6:27:40									67.6	77.8
6:32:43									71.3	82
6:40:00									67.5	76.7
6:45:49									67.6	76.7
6:49:24									71.6	81.2
6:51:57									72.3	83.1
6:54:51									78.9	87.9
6:56:13									70.5	81.6
7:00:00						300	8			

May 12 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
7:13:49									71.4	82.9
7:16:30									70.4	81.4
7:22:20									79.9	90.8
7:26:46									70.5	79.3
7:30:46									70	79.9
7:37:08									71.8	83.8
7:41:35									76.5	87.5
7:42:50									68.2	81.4
7:43:40									71.9	82.4
7:47:00	33L	33R	27	33L						
7:49:30									74.1	84.2
7:51:00									68.4	77
7:53:38									68.6	77.3
7:55:05									73.2	84.2
7:56:10									68.2	78.7
7:59:59									67	76.5
8:00:00						300	6			
8:05:00									68.9	78.4
8:06:30									71.5	79.7
8:07:54									73.4	83
8:12:17									74.7	84.2
8:13:37									80	88
8:15:23									76.4	86.5
8:20:46									74.5	84.2
8:22:14									74.7	84.1
8:26:39									70.6	81.5
8:28:09									73.5	83.3
8:39:10									72.4	82.5
8:44:00									70.2	80.8
8:49:58									74.3	85.6
8:52:58									71.2	82
8:54:39									68.9	78
8:57:45									71.9	81.2
9:00:00						0	5			
9:04:34									71.6	81.8
9:08:49									73.4	83.5
9:10:31									74	84.4
9:15:51									76.3	86.8
9:17:38									68.3	77.9
9:19:12									71.5	82.2
9:20:43									73.3	84.9
9:22:34									71.2	82.5
9:27:52									71.3	81.6
9:31:24									76.7	87.1
9:35:00	4R	4L	4R	4L						
10:00:00						130	7			
10:00:00						130	7			

May 12 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
10:45:00	4R	4L	9	4R	4L					
15:55:35									70.4	81.1
16:10:00	27	22L	22R	22L						
16:31:18									68.4	77.3
16:36:14									75	83.7
16:46:18									73.9	84.2
16:47:07									68.6	77.3
16:58:18									73	84.7
17:09:36									68.6	78.9
17:16:45									81.9	91.2
17:41:58									77.1	87.5
17:42:47									74.2	85.1
18:09:47									73.2	83.9
18:18:56									81.7	91.8
18:23:55									74.9	85.3
18:24:29									69.9	80.2
18:34:51									76.7	86.1
18:38:14									72.2	82.3
18:39:35									72.4	80.9
18:40:40									75.5	85.7
18:43:27									76	86.1
19:00:29									70.9	83.1
19:02:05									74.4	85.5
19:15:58									71.1	81.2
19:20:40									70.2	80.2
19:21:44									70.9	82.1
19:32:23									74.9	84.2
19:35:42									69.8	80.6
19:40:39									67.5	76.7
19:41:39									74.8	86
19:47:58									75.5	85.6
20:06:58									69.7	81.7
20:13:52									67.7	77.9
20:25:49									74.6	85.3
20:28:52									69.5	79.8
20:31:36									68.4	78.9
20:34:30									70	80.1
20:42:00									75.1	86.2
20:51:37									70.1	81.4
20:53:55									75.6	86.7
20:57:36									71.7	81.1
20:58:21									71.6	82.9
21:02:09									70.5	79.5
21:03:08									71.3	81.7
21:06:59									78.2	87.6
21:16:05									70.2	80.2
21:22:46									73	83.1

May 12 Time	Landing Primary	Landing Secondary	Takeoff Primary	Takeoff Secondary	Takeoff Tertiary	Wind Direction	Speed (Knots)	Gusts (Knots)	Lmax (dB)	ASEL (dB)
21:27:55									73.4	84.3
22:19:28									81.6	93.3
22:39:32									76.3	87.1
22:57:08									68.1	78.2
23:00:00	22L	22R	15R	22L						
23:12:34									75.8	86.8

APPENDIX I

CAC Meeting, April 19, 2001: Questions for Massport Re: Supplemental Draft EIS/Final EIR, Submitted by Christine Wrigley, City of Somerville

CAC Meeting, April 19, 2001
Questions for Massport RE: Supplemental Draft EIS/Final EIR
Submitted by: Christine Wrigley, City of Somerville

Annual Hours of Delay

Pages 4-57 to 4-58 state that the Preferred Alternative is estimated to reduce delays by 27-31% (Low Fleet to High Fleet).

- Page 1-30 states that the "modeling results presented throughout the Draft EIS/EIR and this Supplemental DEIS/FEIR represent only those delays that are attributed to Logan conditions" but goes on to state that "the FAA and Massport decided to also assess these delays within the greater context of the total delays at Logan."
    - Page 1-34 states, "Based on this delay reduction and the previous analysis of delays caused by other airports, the proposed airside improvements would have reduced total delays at Logan, including those caused by other airports, by approximately 27%." Why isn't the delay caused by other airports factored into future scenarios? This would provide a more realistic representation of delay reduction of 22-23%, rather than 27-31%.
        - The document estimates that there were 142,000 hours of delay in 1998 attributable to Logan runway and taxiway problems, and an additional 54,683 hours of delay experienced at Logan due to congestion and delays at other airports. This means that 28% of TOTAL delays (Logan-related plus those related to other airports) are caused by other airports. Delays originating at other airports occurred at about 39% of the rate of Logan-caused delays.
    - Are there other categories of delay that are also being removed from the models, such as mechanical problems, severe weather, etc.? This is important to individual travelers because, as the document stands, it misleads them to think that the chance of their particular flight being delayed is reduced by 27-31%, when in actuality it would be far less.
- Table 4.6-2 indicates that total annual hours of delay will still be 100,000 to 200,000, depending on which fleet scenario is used. According to the document, "the FAA's threshold of 20,000 annual hours of delay which is used to identify severely congested (i.e., delay prone) airports" will still be greatly exceeded by Logan with the Preferred Alternative. Therefore, the Preferred Alternative seems to improve the problem only marginally. Why is the delay reduction described as beneficial when Logan will still substantially exceed the 20,000 annual hours of delay?

Air-Traffic Distribution

- Use of percentages (such as Table 4.6-5) is misleading when using statements such as "the Preferred Alternative increases operations over water and achieves a more balanced distribution of operations over land." Why isn't the actual number of flights used? The TOTAL number of flights will increase but will be spread out

over more communities so that the flights in the north/south direction will be *no more* impacted but areas to the west will be impacted significantly.

- Figure 5.2-1 shows that aircraft altitude is 2,000 feet or more at a point 5 miles from takeoff. Why is this the case when operating procedures show that an airplane should be AT LEAST 3,000 feet in altitude?

Demand

- Pages 4-8 and 4-9 discuss the decline in Logan non-jet activity: doesn't this reduce the need for Runway 14/32 since it is proposed, in large part, to accommodate turboprops?
- Pages 4-15 and 4-16 describe how "the construction of unidirectional Runway 14/32 does not increase Logan's normal airfield capacity of approximately 120 operations per hour. This capacity is available at Logan approximately 80% of the time." The capacity with two runways is 90 operations per hour, and with one runway it is 60 operations per hour. How does increasing the amount of time that three runway configurations are available *not* increase the capacity of the airport? Even if one accepts Massport's argument that a new runway will not stimulate demand, the total number of flights will increase. Why is 120 operations per hour assumed to be the ultimate goal?

Preferential Runway Advisory System (PRAS)

- Why is PRAS defined differently throughout the document? Two examples are provided below:
    - Page 1-2, Footnote 3: "The Preferential Runway Advisory System (PRAS) is a computer program that recommends to the FAA air traffic controllers runway configuration options that will meet weather and demand requirements, while providing an equitable distribution of the airport's noise impacts. The primary objectives of PRAS are to distribute aircraft operations in accordance with annual runway utilization goals, and to provide short-term relief from continuous operations over the same neighborhood."
    - Page ES-10, Footnote 4: "Logan's Preferential Runway Advisory System (PRAS) is a set of voluntary targets for FAA runway assignments that were established by Massport, the FAA, and community representatives in 1983. The objectives of the PRAS are to reduce noise exposure for highly impacted communities (i.e., those within the 70 and 75 dB DNL contours) by distributing noise impacts in accordance with runway use goals, to provide short-term relief from continuous aircraft operations over neighboring communities, and to maximize over-water aircraft routings."
- Page 6-56 indicates that PRAS is discarded in favor of capacity and number of operations (first paragraph of 6.2.7.3). Therefore, how can a substantial portion of the EIS/EIR be based on PRAS achievement when it is stated that Massport/FAA will utilize configurations that favor capacity over PRAS goals? Why isn't this discussion included in the PRAS section?
- Section 4.3 states that PRAS was developed with input from community representatives. Why aren't the names of the communities listed? The list will

most likely indicate that the communities northwest of the airport, which will be impacted the most by the Preferred Alternative and the "greater achievement of PRAS goals," were not involved in the development of the PRAS almost twenty years ago. The document states that twelve communities were represented in development of the PRAS but the CAC now represents over *twenty-four* communities.

- PRAS nighttime routing
  Page 4-20: "Whenever possible, controllers will simultaneously use 33L for arrivals and 15R for departures....Dwell and persistence are ignored at night so that this configuration can be used extensively, and when weather permits, controllers typically use this configuration for the full six-hour period."
  - What is the altitude of these "over-water" flights when they cross over land after takeoff and prior to landing?
  - Why is dwell and persistence ignored at night when this is precisely the time when most people are disturbed from overflights?
  - How often is the reverse combination—33L for departures and 15R for arrivals—used at night? Why wasn't this information included? Information provided by Massport's Noise Monitoring Office indicates that this usage occurs more often than the over-water flights between midnight and 6 A.M.
  - Section 4.3.6 discusses the increased use of "overwater routing preferences" as a potential mitigation measure. What potential mitigation is proposed for the communities that are impacted by the overflights that turn back over land after takeoff?
- Continued validity of PRAS goals
  - The May 7, 1999, Certificate signed by MEPA Secretary Robert Durand states that "the Final EIR should discuss whether any updates of the PRAS goals are contemplated, and detail any mechanisms for ensuring that the program fulfills its objectives of creating an equitable noise distribution." Massport's response to this is that "there have been no significant demographic changes to warrant an update of the PRAS goals."
    - Doesn't the simple fact that the PRAS goals are almost 20 years old indicate that the goals may no longer be valid? The document clearly states that the number of flights has increased tremendously during this time period.
    - The document repeatedly states that the PRAS goals were developed with input from twelve communities. The fact the CAC now represents *double* that number of communities is an indication that a greater number of communities are concerned about the impact of Logan airport. Why wasn't this discussed in the document?
    - The CAC has formally requested of the FAA that consideration of revisions to the PRAS be undertaken as an environmental review under NEPA. Why wasn't this request even acknowledged in Section 4.3.3?

        - The CAC has rejected the use of the current PRAS as constituting a basis for mitigation and has repeatedly stated that PRAS goals should be re-evaluated and updated. Why wasn't this mentioned?
- 4.3.4.5 Historic Achievement of PRAS goals
    - The discussion regarding "exceeding PRAS goals" as a positive statement is misleading. Isn't exceeding the goals an indication that communities received more than their so-called fair share of air traffic and, therefore, a more significant noise impact? Page 4-62 states that "the predicated PRAS conformance nearly doubles with 14/32." Doesn't this mean that the impact on affected communities is double as well?
- Discussion of PRAS in response to comments received by Somerville residents
    - Massport states "PRAS goals were established based on a thorough public participation process in response to community noise concerns." How can this be taken as a valid response when (1) PRAS goals are outdated, having been developed almost 20 years ago, and (2) Somerville was not one of the participating communities in development of the PRAS? Please define "thorough public participation process."
    - Massport states, "Total departures from Runway 33L and arrivals to 15R would increase, but many of these are non-jets." Isn't the purpose of 14/32 to accommodate non-jets in order to allow more jets to utilize 33/15?
    - Massport states, "by increasing the number of operations over water, Runway 14/32 would reduce the total annual hours of dwell and persistence over populated areas in accordance with short-term PRAS goals." Since this was included in responses to several Somerville letters, please explain how this specifically applies to Somerville.

Noise Impacts

- The document states that flights to the west of Logan will increase as a result of the Preferred Alternative. Why were there no additional noise monitors added to these locations?
    - Page 5-6 states that the geographic area of the 60 dB DNL or greater contour includes the communities of Chelsea, Everett, and Revere yet there are no noise monitors in Everett (Figure and Table 5.2-4) to assess baseline conditions to accurately determine what the impacts of noise might be under the Preferred Alternative. Why weren't noise monitors added in Everett?
    - Table 5.2-3 indicates "0" population in Everett and Quincy exposed to 60 dB DNL or above, yet Page 5-6 indicates that Everett will experience an increase in noise. Which is the case: will the population in Everett be impacted or not? How many other communities are left out?
- In Massport's response to letters received by Somerville residents, Massport acknowledged that Somerville's overflights will increase and stated that "the highest resulting noise exposure in [Somerville] is estimated to be on the order of 55 dB DNL." How can this be determined when there are no noise monitors in Somerville and none in close proximity to generate a model?

Northwest-Wind Restriction

Page 4-4 states that "The proposed runway will improve Logan's reliability and reduce delays by preventing the decline in airfield capacity that now occurs in northwest winds." However, the document states that a "northwest wind restriction would sacrifice a portion of the delay reduction benefits that could be realized through unrestricted usage of unidirectional Runway 14/32." This contradicts Massport's position that the purpose of the proposed runway is to reduce delays during northwest-wind conditions and appears to support community concerns that this proposal is a document for capacity-building/expansion, not a delay-reduction proposal. The document further states that "decreased usage of Runway 27 [as a result of a wind restricted 14/32] corresponds with other, less desirable changes in runway utilization at Logan."

- "Less desirable" to whom?
- Why are the numbers of people impacted by the wind restriction buried in the Appendix rather than being presented as part of the document?
- Why aren't the total number of people that would benefit from a wind-restricted runway factored into the decision about what is more or less desirable?
- The increase in the number of flights on Runway 27 directly impacts the proposed South Boston Seaport development. Was this factored into the analysis for a wind-restricted 14/32?

Regional Jets

Pages 3-9 and 4-83 discuss the potential usage of Runway 14/32 by regional jets (RJs). The document states that regional jets are "capable" of landing on a 5,000 foot runway — but will they actually use it in practice?

- The document states that RJs are capable of landing on less than a 5,000 foot runway when the runway is dry and there is no wind. How can use of this runway be justified during northwest-wind conditions when one of the conditions of landing is that there is no wind?
- Northwest-wind conditions generally occur in storm conditions, when the runway is likely to be wet, yet the document states that Embraer model RJs require dry conditions. What is the likely utilization of Runway 14/32 when the runway does not meet the conditions stated of "no wind" and "dry"?

Air Quality

- The document repeatedly states that there are "environmental benefits" associated with the Preferred Alternative. However, page 7-21 states that "the overall air quality impacts associated with the Preferred Alternative are beneficial or will remain imperceptible, when compared to the No Action Alternative." If impacts are "imperceptible," how can it be stated that there is a benefit?

Historic Properties

The document states that an historic property is defined as any site, building, structure, or object eligible for inclusion in the National Register of Historic Places that is within the 65-dB contour. The EOEA Scope included additional parklands that should be included in the analysis such as the Arnold Arboretum, Franklin Park, and the Emerald Necklace,

even though each is well outside the contour line. Why weren't additional National Register sites included such as Bunker Hill in Charlestown and Prospect Hill in Somerville, both of which are also located outside of the 65-dB contour but are geographically closer to Logan?

APPENDIX J

September 27, 2000
Letter to Administrator Jane Garvey
from Mayor Dorothy A. Kelly Gay,
City of Somerville

CITY OF SOMERVILLE, MASSACHUSETTS
DOROTHY A. KELLY GAY
MAYOR

September 27, 2000

Ms. Jane Garvey, Administrator
Federal Aviation Administration
800 Independence Avenue, N.W., Room 1010
Washington, DC 20591

Dear Ms. Garvey:

I am writing to you to express my opposition to Runway 14/32, the centerpiece of the proposed airside improvements for Logan Airport. The City of Somerville is on record with the FAA, Massport, and the Massachusetts Executive Office of Environmental Affairs in opposition to the construction of Runway 14/32. I want to stress that the position of my Administration has not changed from that of former Mayor, now U.S. Congressman, Michael Capuano, and that my Administration continues to oppose this project.

Logan Airport's existing operations are negatively impacting the City of Somerville. Residents have contacted both representatives in City Hall and Massport's Noise Complaint Line in increasing numbers since I became Mayor. Somerville's participation in Massport's Community Advisory Committee (CAC) is in part to address these concerns.

Massport's position is that the proposed airside improvements support Boston's regional economy. I disagree with Massport's means to achieve economic development. I believe that it is the quality of life and supportive business climate in our communities within the Greater Boston area that contributes to the desirability of the region as a business location. It is the diversity of opportunities and livability of each city and town that is a marketing and economic development tool for business retention and recruitment. The proposed airside improvements for Logan Airport would be detrimental to these qualities and could eventually jeopardize some economic development opportunities that may otherwise have been possible.

Runway 15R/33L is the Logan runway that impacts Somerville most directly. According to the SDEIS, the proposed Logan expansion would allow Massport to increase departures on Runway 33 from the current rate of 5% to almost 12%. Somerville is also impacted by arrivals on Runway 15R which would increase from the 1998 rate of 1% of arrivals to 8% with proposed Runway 14/32. While the FAA and Massport flight paths do not indicate that Somerville is

impacted by departures from other runways, Massport's Noise Complaint Line data indicate that Somerville residents have complained of noise from activity on Runways 4/22 and 9/27.

It is my understanding that the communities northwest of the airport will experience more overflights and greater noise impact if proposed Runway 14/32 is constructed. Reports indicate that Somerville will experience almost a 300% increase in air traffic if Runway 14/32 is constructed due to the increased number of jets that can be accommodated on Runway 15/33 if smaller planes are assigned to Runway 14/32. Increased noise over Somerville would be detrimental to the quality of life in our city.

While we support CAC's efforts to encourage equitable distribution of air traffic in the Greater Boston area, I do not agree that it is equitable for Massport to allot Somerville its "share" of this traffic almost exclusively during the "off-peak" hours which are late evenings and early mornings. Construction of Runway 14/32, as well as the proposed reduction in approach minimums for Runways 15 and 33, will add to the number of disturbances already endured by the residents of Somerville. Somerville is the most densely populated community in the Commonwealth and over 40% of residents are considered to be low- and moderate-income. According to Somerville school enrollment statistics, 42% of the students in 1999 were minorities and 30% did not speak English at home. More than half of the students in 1999 were low-income and 15% were below the poverty level. Yet Massport contends that increasing flights over communities to the northwest of Logan supports "environmental justice" and will not result in a disproportionate impact to minority and/or low-income populations. I strongly disagree with Massport's position due to the impact the proposed airside improvements will have on our ethnically diverse community.

As you know, the FAA Panel that consists of three members appointed by Governor Cellucci and three by Boston Mayor Thomas Menino shapes the final Environmental Impact Statement (EIS) for the proposed airside improvements. The format and timing of these panel meetings do not allow for sufficient public involvement or participation by the many other communities that will be impacted by the proposed airside improvements. In addition, most of the efforts made by Massport to inform the public have been public relations efforts to support the runway and not an effort to gain real input regarding potential alternatives required by the EIS process. I appreciate the efforts that you have made to make the Supplemental Draft EIS process more effective and hope that you continue to work with the CAC to allow additional public input prior to the development of a Final EIS.

I implore you to further explore alternatives to the proposed Runway 14/32 and allow communities to fully participate in this process.

Sincerely,

Dorothy A. Kelly Gay

Dorothy A. Kelly Gay
Mayor

Cc: Vince Scarano, Manager, New England Regional FAA Airport Division
Virginia Buckingham, Massport Director
Tom Kinton, Massport Aviation Director
Betty Desrosiers, Director of Aviation Planning, Massport
Terry Fleiger, Regional Air Traffic Division
Robert Durand, MA Executive Office of Enviromental Affairs
U.S. Senator Edward Kennedy
U.S. Senator John Kerry
Congressman Michael Capuano
City of Boston Mayor Thomas Menino
Somerville Board of Aldermen
Stephen M. Post, Executive Director, Somerville OHCD
State Senator Thomas Birmingham
State Senator Charles Shannon
State Representative Vincent Ciampa
State Representative Patricia Jehlen
State Representative Timothy Toomey
Anastasia Lyman, Co-Chair CAC
Sandra Kunz, Co-Chair CAC
Rick Rodes, President CARE

APPENDIX K

April 22, 1999
Letter to Arthur Pugsley, MEPA, from William A. White, Jr., Chairman, Committee on Housing and Community Development, City of Somerville

CITY OF SOMERVILLE, MASSACHUSETTS
BOARD OF ALDERMEN

April 22, 1999

WILLIAM A. WHITE, JR.
ALDERMAN AT LARGE

AUG 0 [illegible] 2000

RECEIVED
APR 22 [illegible]
MEPA

Delivered by hand
Mr. Arthur Pugsley
MEPA Unit
Executive Office of Environmental Affairs
100 Cambridge Street, 20th floor
Boston, MA 02202

Dear Mr. Pugsley:

The following are my comments to the Draft Environmental Impact Statement for Logan Airside Improvements Planning Project dated February 1999 ("DEIS"). This response first provides an overview of the current impact of air traffic from Logan Airport on the City of Somerville (the "City"). Next, it details the defects in the noise analysis of the DEIS, paying particular attention to the absolute failure of Massport to analyze current noise impacts on the City by any realistic measures. It then addresses the defects in the DEIS' analysis of the future noise impacts on the City that would result from the construction of the additional runway.

I. OVERVIEW

The City is the most densely populated community in the Commonwealth of Massachusetts with a population of about 80,000. The City stands directly in the path of planes departing from Runway 33 L. (5-30 of DEIS) This runway directs flights over the City when the FAA utilizes the one runway configuration during strong Northwest winds and when the FAA utilizes the two runway configuration during moderate northwesterly winds. (1-19, 1-20 of DEIS) This configuration also is used during weekends, especially mornings beginning at 6:15 a.m., in what Massport illogically describes as the "equitable adjustment of the burdens of air traffic." The City also has a number of hills directly under the flights from Logan

16 BROWNING ROAD · SOMERVILLE, MASSACHUSETTS 02145
(617) 623-9110

Airport. While northwesterly winds prevail, the City suffers from constant air traffic, especially during the late evenings until well after midnight followed by early mornings beginning at 6:15 a.m. Massport recognizes that these winds prevail during 37% of the year. (DEIS figure 1.5-7) Because the FAA also uses this configuration during the weekends, affected City residents are unable to receive any respite from this traffic frequently during the fall, winter and spring months.

The topography of the City is such that a number of hills are directly under flights from Logan. Although the City begins about 3 miles from the end of runway 33 L, these elevated areas in the City receive substantial noise impact similar to other areas located much closer to Logan. For example, as a resident of Winter Hill, during the winter I have observed aircraft flying so close to dwellings that noise vibration caused snow to fall off of pitched roofs.

Over the recent past, I and other Aldermen have consistently received numerous phone calls from constituents who have suffered from air traffic noise over the City, including distraught parents of young children who are unable to get 8 hours of sleep. My Winter Hill venue has allowed me personally to experience the impact of air traffic, especially the effects of constant dwell in the evenings and following mornings, that creates a situation where numerous residents are unable to receive a decent night's sleep over extended periods of time. This lost sleep cannot be made up during the weekends because the FAA intentionally directs air traffic over the City on weekends beginning at 6:15 a.m. These concerns have been relayed to Massport's noise complaint telephone line. Massport offers no remediation program for the City and actually downplays the noise impact both in statements to the media and in the DEIS.

Because of growing complaints by residents over noise, the Board of Aldermen last summer invited representatives of Massport to appear before the Board of Aldermen. When asked if Massport had any monitoring devices within the City or had sent anyone to personally observe the noise level, especially over the hilly areas with dense populations, Massport responded negatively. Massport further stated that it would not provide any noise monitors in the City of Somerville. Instead, Massport relies on computer modeling to measure noise in the City. There is no evidence, however, to demonstrate whether Massport's computer modeling accurately reflects the noise born by residents where there are hilly configurations. Clearly, Massport's cavalier attitude toward the City should be

fatal to the DEIS since it shows that Massport has no objective data to demonstrate the real impact of noise on the City's many residents.

II. THE DEIS FAILS TO PROVIDE ANY OBJECTIVE DATE ON CURRENT NOISE OVER THE CITY

Although the heart of the flight tracks from 33L is over the City and is located less than four miles from the end of Runway 33-L, (5-30), Massport locates no noise monitoring equipment within the City or within any reasonable distance from the City. (5-13) Interestingly, many of the noise monitors located to the south of Logan are at greater distances from runways than impacted areas of Somerville. (Id.) Moreover, although many more departures from 33L fly over the City than Everett (see 5-30), Massport does not even consider Somerville to be an area for evaluation (5-19). Despite this lack of objective data over current noise conditions in Somerville, Massport argues that the proposed expansion will "more equitably adjust air traffic" by tripling the volume over the City of Somerville.

To support its claims relating to noise impact, Massport uses a noise measure which bears no reasonable relationship to the actual noise experienced by people nor the effects of this noise on people. The Day-Night Sound Level (DNL) used by Massport is "a weighted sound level of a steady-state noise during a 24-hour day which contains the same sound exposure as does the summation of the sound exposures from all of the individual events that occur during a 24-hour period, with the provision that noises occurring at night are increased by 10dB." Without doubt, those areas with a high DNL suffer from excessive noise. But because it is a 24 hour average, the DNL understates the actual impact of noise on many affected communities such as Somerville.

For example, Somerville suffers from severe air traffic on many evenings between the hours of 10:30 p.m. through 12:30 a.m. and the following mornings between 6:15 a.m. through 8:00 a.m. with little traffic for the rest of the day. Needless to say, the affected residents suffer from sleep deprivation with physical impacts the next day. Another community could experience constant air traffic from 10:00 a.m. through 6:00 p.m. A reasonable person might conclude that the first community bore the more severe consequences of air traffic since the noise

would come at night and the early morning against a quieter background when most people are at home and trying to sleep. In the second community, most people would be at work, out of the house, or doing activities which do not require quiet (unlike sleep) Under DNL as used by Massport, however, the first community would not appear to suffer any adverse consequences. Likewise, under Massport's definitions of dwell and persistence, the first community would not even qualify for relief. (See 5-18, 5-19 for Massport's definitions).

To an elected official in an affected community, it is beyond belief that the DEIS does not measure and discuss the amount of noise that communities may experience when there is late evening flight traffic followed by early morning flight traffic. In such situations, affected residents cannot realize a decent night' sleep. Perhaps this oversight is understandable, since such a study would show many thousands of people in the Greater Boston Area are subject to severe sleep deprivation many times during the year as a result of air traffic from Logan Airport.

A more reasonable method to determine the impact of noise upon a community should take the noise level, time of day and population density into account. If a dense community is subjected to noise which would awaken an average person during the late evenings and early mornings, large numbers of people may have their sleep affected for extended periods of time. Most people would agree that such an area would be suffering from severe environmental consequences. In the DEIS, however, Massport has not undertaken such an analysis. A realistic figure should be developed to measure the "cost" of noise, measuring the number of people affected by noise, the level of noise, and the consequences of noise (such as hours of lost sleep, inability to enjoy one's home, etc.). Such a measure should then be contrasted with the economic costs which the DEIS claims result from delays.

Since Massport has no noise monitoring devices in Somerville, it is impossible for anyone to obtain actual hard data for noise levels, especially in hilly areas, during the late evening and early morning hours to arrive at such a measure on their own. In an effort to obtain some hard data, I used a Radio Shack Sound Level Meter to take measurements at Winter Hill. Depending on the altitude of planes, I measured up to 110 dB out doors and 75dB indoors with windows closed during late night and early morning hours. This hard data confirms my personal

experience and the experience of constituents suffering from this air traffic. For example, I have been awoken on numerous mornings by flights departing at 6:00 a.m. after suffering from persistent flights that occurred from after 11:00 through midnight (and even 1:00 a.m.) the prior evening. In fact, on Sunday, April 10, 1999 three flights traveled over Winter Hill from approximately 1:00 a.m. through 1:15 a.m.. The following morning, flights started at 6:15 a.m., which awoke me. The last four Sundays in a row air traffic has begun at 6:15 a.m. During the past week, I was awoken twice after 3:00 a.m. and received complaints from constituents who were also awoken. I have personally contacted the noise complaint telephone line on a number of these occasions, even Thanksgiving and Christmas morning at 6:30 a.m. Of course, Massport takes the information but provides no relief. (Copies of some notices are attached hereto as Exhibit A). Given my personal experience with noise and the experiences of my constituents, I can affirmatively state that the DEIS is totally defective in its analysis with respect to the current noise impacts on the City and elsewhere.

III. THE DEIS FAILS TO ADEQUATELY ADDRESS THE NOISE CONSEQUENCES TO THE CITY IF THE PROPOSED RUNWAY IS BUILT

Since the DEIS fails to objectively measure the current noise impacts on the City, it is impossible to reasonably evaluate the impact of the proposed expansion on the City. As discussed above, Massport relies on its general discussions of decibel levels over areas, but does not provide a realistic evaluation of the impact of the additional noise on real people in the City. Interestingly, although departures from 33L are expected to triple, and the heart of this flight pattern is over the City, (6-13), Massport does not specifically address the impact on the City from this tripling in air traffic. Instead, Massport provides charts showing increases in dwell exceedence and persistence exceedence for the various runways. (Figures 6.2-5 through 6.2-8).

These charts demonstrate that dramatic increases in dwell and persistence over the City will result from departures from 33L if the runway is constructed. There is, however, no description of the impact of the new runway on heavy late night overflights followed by heavy early morning overflights. The discussion in Part II above showed that Massport and the DEIS does not measure or address the level of late night overflights followed by heavy early morning overflights on the

City. My own experience, however, demonstrates that such level is substantial during much of the year. Since 33 L is the only runway that can be used when there are severe northwest winds, if the runway is built, the City will continue to suffer from such late night overflights followed by early morning overflights when such winds predominate. But, the City will then also suffer from excessive dwell and persistence during the rest of the day resulting from the use of the new runway. A fair reading of the DEIS, however, shows that these clear noise environmental impacts to the City are not adequately addressed.

Not only is there a clear danger of severe noise environmental impacts on the City, but the remedial measures proposed by Massport are ineffective. For a community like Somerville which suffers from substantial late night followed by early morning overflights, Massport offers no soundproofing. The only remedial measure discussed in the DEIS is the projected increase in the use of Stage 3 aircraft. (6-9). However, use of stage 3 aircraft is already required during the late night and early mornings. But it is the noise from these stage 3 aircraft that currently awakens people in the City after 11:00 p.m. and after 6:00 a.m. And without actual hard data from noise measurements in places such as Winter Hill in the City, there can be no objective analysis of the noise experienced by people when these stage 3 jets are used. Unfortunately, it appears that the proposed remediation requiring the use of stage 3 jets would be nothing more than an empty palliative for the residents of the City.

IV. SUMMARY

In summary, the DEIS utterly fails to address the current impact of noise from Logan on the City, despite the fact that the City is the densest community in the Commonwealth. Likewise, the DEIS fails to address the current level of late evening followed by early morning overflights, despite the fact that this type of air traffic results in substantial sleep deprivation over extended periods of time.

Lastly, the DEIS fails to address the future noise impact of the proposed runway on the City. As a result, the Secretary of Environmental Affairs should insure that the Final EIR measures and discusses these present and future noise impacts on the City as set forth herein

Very truly yours,

William A. White, Jr., Chairman
Committee on Housing and
Community Development

APPENDIX L

April 23, 1999
Letter to Secretary Robert Durand
from William Roche, Acting Mayor,
City of Somerville

CITY OF SOMERVILLE, MASSACHUSETTS
OFFICE OF HOUSING & COMMUNITY DEVELOPMENT
WILLIAM ROCHE
ACTING MAYOR

JAMES J. BRETTA
EXECUTIVE DIRECTOR

DIRECTORS
Mary E. Bolster
Paul Connolly
Todd M. Fontanella
Sherri N. Goldenberg
Paula Stuart

April 23, 1999

Robert Durand, Secretary
Executive Office of Environmental Affairs
MEPA Unit
100 Cambridge Street, 20th Floor
Boston, Massachusetts 02202

RE: EOEA # 10458 - COMMENTS ON DRAFT EIR/EIS - AIRSIDE IMPROVEMENTS PROJECT, LOGAN AIRPORT

Dear Secretary Durand::

This letter serves to transmit additional comments from the City of Somerville on the above referenced project. Enclosed, please find the City's comments previously submitted for your records.

The City is already on record regarding certain components of the Airside Improvements Project, in particular the construction of Runway 14-32. Here, I'd rather raise some general issues which focus more on the completeness and adequacy of the draft EIR EIS.

Our overall impression is that Logan is developing Runway 14-32 because it hopes to put a major dent in the low-fare airline wars. Repeatedly throughout the document, it is clear that Massport is not cooperating with the other regional airports - it is competing for their business. **Competition is the key ingredient driving Logan's expansion.** This fact is bolstered by Massport's own use of the term "leakage" in the document. For us, that explains Massport's emphasis on expansion of this facility. It is assumed to be the path of least resistance and expense. The facility is also

one that is under Massport's control.

The EIR/S is instructive. It illustrates well that other airports are absorbing some market share, and reducing the need for passengers to fly to Logan in order to connect to other markets. The other airports have been successful in luring low-fare carriers - possibly more so than Logan? I'm assuming that this is a market Massport feels it must grow at Logan, or it will continue to see its role in the marketplace decline.

I especially found it interesting that Section 2 continuously discusses "recapture" of passengers. Massport uses this term as if the passengers were Logan's to begin with. This is erroneous: some of these passengers are new trips, others would have chosen alternative transportation or other airports besides Logan. Massport takes every opportunity to tell the reader how important Logan is. Remember, there are new employers and residents in Rhode Island (for example) who did not consider Logan as an alternative - T.F. Green is at their back door.

The details on air/rail ridership changes projected when the Northeast Corridor project is completed are encouraging. It should be noted that Massport has been reluctant to recognize the Northeast Corridor rail project in the past; in fact, the previous Secretary of Environmental Affairs cited that as a deficiency of the annual GEIR two years ago.

Repeatedly, Massport makes determinations about people's mode choice on the basis of travel time and mileage. Discuss the Portland-Boston route, for example. There aren't many choices except for autos at this time. If workable alternatives are developed and promoted, the public will use them.

Massport makes some very true statements about its agency's role in shaping transportation policy. However, it should be noted that agencies above and around Massport have a great deal to do with shaping transportation policy which is favorable to Massport's objectives. The FAA is a clear champion of the airline industry, and has clout. Perhaps FAA cannot "dictate which airports an airline may serve, the schedules or fares a carrier charges", but it can exercise control over airport design, capacity and operation which have a lot to do with an airline's decision to provide service at a given facility, or to pursue a regional policy which decides the role a particular airport will play in a region.

The noise analysis referred to states that the 5,000 foot runway better met Massport's overall objectives, particularly in the area of noise reductions to impacted sensitive receptors. However, Section 3-10 does not go into great detail concerning the performance of each alternative. I'd like to see the "clear benefits" substantiated. Assumed, this means that a larger runway can accomodate more aircraft types, thus removing those aircraft from the other runways which fly over greater numbers of sensitive receptors.

With respect to the centerfield taxiway - I don't have any disagreements with what is stated, but it

is important to point out that this improvement will also increase airport traffic capacity - and, taxiway delays apron congestion will be relieved for a temporary period. And, with more queue space available, noise and air pollution impacts to adjacent communities will also increase.

The statement is made that "delay statistics for Logan Airport confirm that it is unable to accommodate existing demand levels without incurring unacceptable levels of delay". Unacceptable to whom? FAA, passengers, Massport? It goes right back to proposing projects which will reduce delay effectively, for a reasonable time period - otherwise, it is dishonest to propose this improvement as a worthwhile delay reduction measure, especially without noting that delays will resume previous levels if an airport-wide growth and expansion plan is to be pursued. **The problem is not adequately defined. In fact, the problem appears to be misrepresented.**

Regarding ambient sound levels. It is true that nighttime aircraft operations are more noticeable and annoying because the ambient sound level is lower. In surrounding, less urbanized communities, the sound is even more noticeable. This problem will increase with additional flight activity, and may be tempered somewhat by aircraft improvements.

Passenger Facility Charges (PFC's) - although Massport received approval to assess this fee on each passenger in 1993, is the fee being collected? It was unclear from reading the document.

It's noted that elevated terrain has an affect on sound propagation - particularly in East Boston. This has been raised in other communities, including Somerville.

In Summary, the EIS/R fails to address the following:

Project cost to the environment and to human health. Where is the risk analysis, particularly for the anticipated noise exposure and air pollution which will result from this project? Particularly, we believe that the increased activity at Logan Airport will propagate additional traffic - in already congested areas. We have always believed that creating and or expanding other facilities in the region would cut down trip miles to from the airport, and would aid overall environmental quality. This is particularly important when the EIR EIS states that over 50% of Logan passengers originate in the Route 128 and 495 highway regions. Regional employers will appreciate this, too.

Project cost to property owners. Increased traffic at this location will impact all classes of property owners in the area, particularly those which are sensitive receptors.

Inadequacy of noise standards. Reliance on an average Day-Night Sound Level (DNL) contour inadequately characterizes true noise impacts associated with the Project. Other reviewers have stated that the use of this average downplays the actual noise levels experienced by sensitive receptors - it is the individual (higher) noise emissions which more negatively impact surrounding residential receptors - not the average level. HUD and FAA definitions are at fault here. We ask

that MEPA address this issue.

Connection to Landside Improvements. The focus of this Draft EIS/EIR is on the Airside Improvements. The City, after reading the documents, does not believe that improvements to gates, terminals and other landside facilities have been properly presented within the context of this document. That is a serious flaw, because the landside and airside facilities are interdependent and **should not be separated** insofar as both contribute to the state of overall airport operations and the true operational objectives for this facility. The City believes that if this is done, the problem definition will change significantly.

For the above reasons, we respectfully request that the Draft EIR/EIS be withdrawn. We also recommend that a regional approach be taken to dealing with what is a regional issue. My administration is willing to participate in such an effort.

Thank you.

Sincerely,

William Roche

William Roche
Acting Mayor

cc: Anastasia Lyman, Massport Citizens' Advisory Committee
Allison Stieber
Todd Fontanella, Somerville CAC representative
James Bretta, OHCD
U.S. Representative Michael Capuano
Senator Thomas Birmingham
Senator Charles Shannon
Representative Patricia Jehlen
Representative Timothy Toomey
Representative Vincent Ciampa
Somerville Board of Aldermen

APPENDIX M

September 30, 1998
Letter to Anastasia Lyman, Co-Chair CAC,
from Michael E. Capuano, Mayor,
City of Somerville

CITY OF SOMERVILLE, MASSACHUSETTS
OFFICE OF THE MAYOR

MICHAEL E. CAPUANO
MAYOR

September 30, 1998

Anastasia Lyman, Co-Chair
Community Advisory Committee to Massport
18 Greenough Avenue
Jamaica Plain, Massachusetts 02130

RE: LOGAN AIRPORT OPERATIONS AND FUTURE EXPANSION PLANS

Dear Ms. Lyman:

My staff is presently reviewing the *Logan Airport 1997 Annual Update* and is preparing comments for that document which will be submitted to the Executive Office of Environmental Affairs under separate cover. However, in a related analysis, I want to communicate with you at this time to express my serious concerns about the present operation of, and future plans for, Logan Airport.

Logan Airport's existing operations are negatively impacting our community. This year alone, Somerville residents have reported a marked increase in air traffic - and increased noise impacts generated by this traffic. Our participation on the Advisory Committee is directly linked to this air traffic growth and its negative impacts. I intend to do whatever is possible to address this.

I'm aware that the Citizens' Advisory Committee (CAC) has debated the merits of several projects which are intended to improve Logan Airport's operating safety, operating efficiency or, in our opinion, add facility capacity. The Logan Airside Improvements Planning Project list cites four key concepts: construction of a new runway 14/32, new taxiways, operational improvements including equipment to permit instrument landings on certain runway(s), and peak period pricing. Particularly, peak hour pricing and the proposed construction of Runway 14/32 were significant issues. I'd like to address Runway 14/32 here.

I understand that the Runway 14/32 project is not new - in fact, it has been proposed and debated for many years. It concerns me greatly, as I'm sure it does you, that Massport officials have spoken publicly about a commitment to implement projects such as Runway 14/32 without any commitment to a reliable public review, permitting and construction schedule. This has raised doubts as to the credibility of the process - will the public have any ability to improve existing airport operation problems? Will the public have real influence upon major transportation and environmental policy decisions for future operation of the airport?

Air travel grows and will continue to do so - my community's participation in the Citizens' Advisory Committee is recognition of this growth and the resultant impacts from it. However, this growth in air travel must be handled in a regionally balanced, equitable manner. Intermodal solutions (air/rail/water/roadway) must be prioritized over traditional mode-specific approaches.

It is clear to me that the proposed runway will effect only a short-term improvement in delays while adding flight operations capacity that will soon be consumed. To add a runway is not significantly different from adding additional highway capacity in urban areas - in the long term, these projects do not promote greater equity and efficiency in transportation - they only contribute to additional congestion. It will not help to resolve long-term air traffic impacts - instead, it is likely to generate additional noise for abutting residential neighborhoods and for communities like Somerville.

On that basis, I find at this time that I cannot support permitting and construction of Runway 14/32.

Sincerely,

Michael E. Capuano,
Mayor

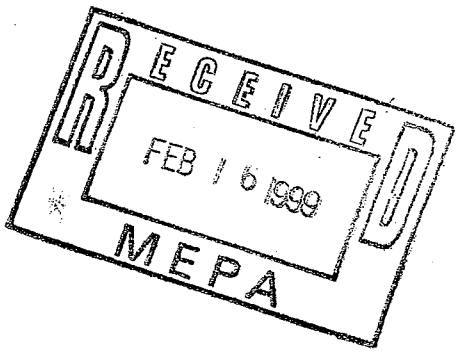
cc: Todd Fontanella, OHCD

APPENDIX N

Massport's Notice of Project Change

Aviation Division
Massachusetts Port Authority
One Harborside Drive, Suite 200S
East Boston MA 02128-2909
TEL (617) 561-1600 FAX (617) 561-1609
www.massport.com

February 16, 1999



Secretary of Environmental Affairs
Attention: MEPA Office
Mr. Arthur Pugsley - EOEA No. 10458
100 Cambridge Street
20th Floor
Boston, MA 02202

Project Name: Logan Airsides Improvement Planning Project ("Project")
Project Location: Boston-Logan International Airport
Boston/Winthrop
Project Proponent: Massport
EOEA Number: 10458

RE: Transmission of Draft Environmental Impact Report ("Draft EIR") - Extension of Public Comment Period - Notice of Project Change

Dear Mr. Pugsley

On behalf of Massport, and in accordance with 301 CMR § 11.16(3), I hereby transmit three (3) copies of the Draft EIR for the above referenced Project. One copy of the Draft EIR is being forwarded to each person or agency who commented on the Environmental Notification Form ("ENF") previously filed with your office, notice of which filing appeared in the Environmental Monitor on August 8, 1995. In accordance with the Secretary's Scoping Certificate dated August 8, 1995, a copy of the Draft EIR is also being circulated to those persons who commented on the proposed Scope for the 1994 Logan Generic Environmental Impact Report. A list of these persons and agencies is enclosed and marked "Distribution List". As you will note, the Draft EIR has also been prepared and is being processed as a Draft Environmental Impact Statement under federal law.

The Project is intended to provide improvements to alleviate the aircraft arrival and departure delay problem at Logan Airport. At current levels of operations Logan is one of the most delay prone airports in the United States. As the analysis in the Draft EIR indicates, this problem will become even worse over time. The concomitant environmental impacts associated with current and projected future conditions will also worsen significantly if no action is taken. The Preferred Alternative identified in the Draft EIR will provide significant delay reduction benefits and will also provide a unique opportunity to achieve certain environmental benefits in both the noise and air quality impact categories. As discussed in the Draft EIR, mitigation measures are available and will be implemented to address cumulative and construction-related impacts associated with implementation of the Preferred Alternative. The Draft EIR demonstrates that Logan can efficiently accommodate current and projected levels of aircraft operations in an environmentally responsible manner through implementation of the Preferred Alternative.

Extension of Public Comment Period

In response to a request made by members of the Airside Review Committee (ARC), Massport hereby requests and, pursuant to 301 CMR § 11.08(4), consents to an extension of the public comment period from 30 to 60 days following publication of the notice of availability of the Draft EIR in the Environmental Monitor.

Notice of Project Change

In recognition of the fact that three years have elapsed between publication of the ENF and the notice of availability of the Draft EIR that will be published in the Environmental Monitor, I hereby submit a Notice of Project Change as required by 301 CMR § 11.10(2)(a). This Notice of Project Change has also been circulated to each of the persons and agencies who received the ENF or commented on the ENF, as required under 301 CMR § 11.10(7), all of which appear on the attached Distribution List.

This Notice of Project Change is attributable solely to the passage of time. Furthermore, the lapse of time between the publication of the ENF and the publication of notice availability of this Draft EIR has no adverse environmental consequences. The additional time period has been used productively to provide reliable and updated data and to allow further recent discussions with the public, including special meetings held in various communities affected by the Project. The factors to be considered in accordance with 301 CMR § 11.10(6) support a determination that this Notice of Project Change has no adverse environmental consequences:

a) Expansion of the Project
No increase in square footage, linear footage, height, depth or other physical dimensions of the Project has occurred.

b) Generation of Further Impacts
Since the Project has not commenced and is only in the initial stages of environmental review, no change in release or emission of pollutants or contaminants will occur.

c) Change in Schedule
No Preferred Alternative was identified or selected and, consequently, no construction sequencing or phasing was developed prior to the completion of the Draft EIR. Therefore, no change in the expected commencement, completion or work schedule dates for the Project has occurred.

d) Change in Project Site
No change in the Project site has occurred.

e) New Application for Permit or Request for Financial Assistance for Land Transfer
No new application for permit, request for financial assistance or land transfer has occurred.

f) Material Delay in Realization of Environmental Benefits
Since a Preferred Alternative and Project implementation schedule were not developed prior to completion of the Draft EIR, there has been no material delay in realization of environmental benefits associated with the Project. I note, however, that the analysis of the Preferred Alternative in the Draft EIR indicates that certain environmental benefits can be realized if the Preferred Alternative is implemented.

g) Changes in Ambient Environment
No significant changes in the ambient environment have occurred. The Draft EIR reflects current analysis based on updated information. In addition, updated information with respect to Logan operations and impacts has been provided to your office and interested members of the public and governmental agencies through the Logan Generic Environmental Impact Report ("GEIR") process. The latest GEIR submission occurred in August, 1998 with the 1997 Update. Annual GEIR filings were also submitted in September, 1997 and July, 1996.

Also of relevance is the fact that the Draft EIR provides analysis consistent with the requirements of Executive Order 385 issued April 23, 1996. In particular, the Draft EIR provides a comprehensive review of regional transportation facility planning efforts, management plans and improvement projects and analysis of passenger diversion from Logan that is expected to result from these efforts. The Preferred Alternative also provides for improvements at an existing, developed site in an environmentally responsible manner.

Based upon the foregoing, we request that the Secretary determine that the lapse of time between publication of the ENF and the Notice of Availability of the Draft EIR does not have significant environmental consequences within the context of 301 CMR §11.10 and therefore does not warrant additional analysis not otherwise provided in the Draft EIR.

Respectfully submitted,

MASSACHUSETTS PORT AUTHORITY

Betty J. Desrosiers
Director, Aviation Planning & Development

cc: See attached Distribution List.

APPENDIX 0

EOEA's Response to Massport's Notice of Project Change

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street, Boston, MA 02202

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February 26, 1999

Ms. Betty J. Desrosiers
Director, Aviation Planning & Development
Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909

Re: Logan Airside Improvements Planning Project, EOEA File #10458

Dear Betty:

In your letter dated February 16, accompanying the Draft Environmental Impact Report (EIR) for the above project, you also filed a Notice of Project Change (NPC), as required under Section 11.10(2)(a) of the MEPA Regulations for a lapse in time between the publication of the Environmental Notification Form and the publication of the notice of availability of the EIR. Because the issues relating to the review of the EIR and the NPC are necessarily intertwined, I will defer a decision on whether further review relative to the NPC will be required until the completion of the review and comment period on the EIR.

Sincerely,

Jay Wickersham, MEPA Director

cc: Arthur Pugsley, MEPA

jwickers/logan.ltr

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APPENDIX P

Analysis of Airport Noise by Somerville and Other Areas Northwest of Logan Airport, Paul Schomer (June 2, 2001)

ANALYSIS OF AIRPORT NOISE BY SOMERVILLE AND OTHER AREAS NORTHWEST OF LOGAN AIRPORT

June 2, 2001

I. INTRODUCTION

1. Measurements

The most fundamental way to assess noise is to measure it. Simply stated, if one wishes to know what the noise level is, one can set out a meter and measure it. However, nothing is ever quite as simple as it seems. In the case of noise measurement, one must insure that only the source in question is measured. For example, if traffic noise and aircraft noise exist jointly, it may not be possible to directly measure just the aircraft noise. Also, one must measure long enough to capture and sample the full range of activities of the noise source in question in an unbiased fashion.

Boston's Logan Airport maintains a large unattended noise monitoring system. Several of the monitoring sites are shown in Figure 1. In particular, there are 4 sites situated northwest of the airport. These are sites 13 (East Boston), 15 (Chelsea), 21 (Everett), and 22 (Medford). These 4 monitor sites primarily measure the noise from takeoffs on Runway 33L. This occurs because there are many more jet aircraft takeoffs on Runway 33L than there are landings on Runway 15R (Logan 1999 ESPR). Figure 2 shows the flight tracks for jet aircraft taking off on Runway 33L (Logan 1999 ESPR). As indicated in Figure 2, the aircraft takeoff to the northwest with some continuing straight and many turning to the west. Monitoring sites 13 and 15 also record the noise from propeller aircraft that takeoff on Runway 22L or 22R and turn sharply right, or that takeoff on Runway 4L or 4R and turn sharply left.

The noise office at Logan Airport has published the total yearly average DNLs measured by these monitors for the years from 1991 through 2000 (except for 1992 and 1993 at Chelsea). However, these published levels include all noise and not just airport noise. One purpose of this analysis is to assess the validity of the results of monitoring northwest of Logan airport.

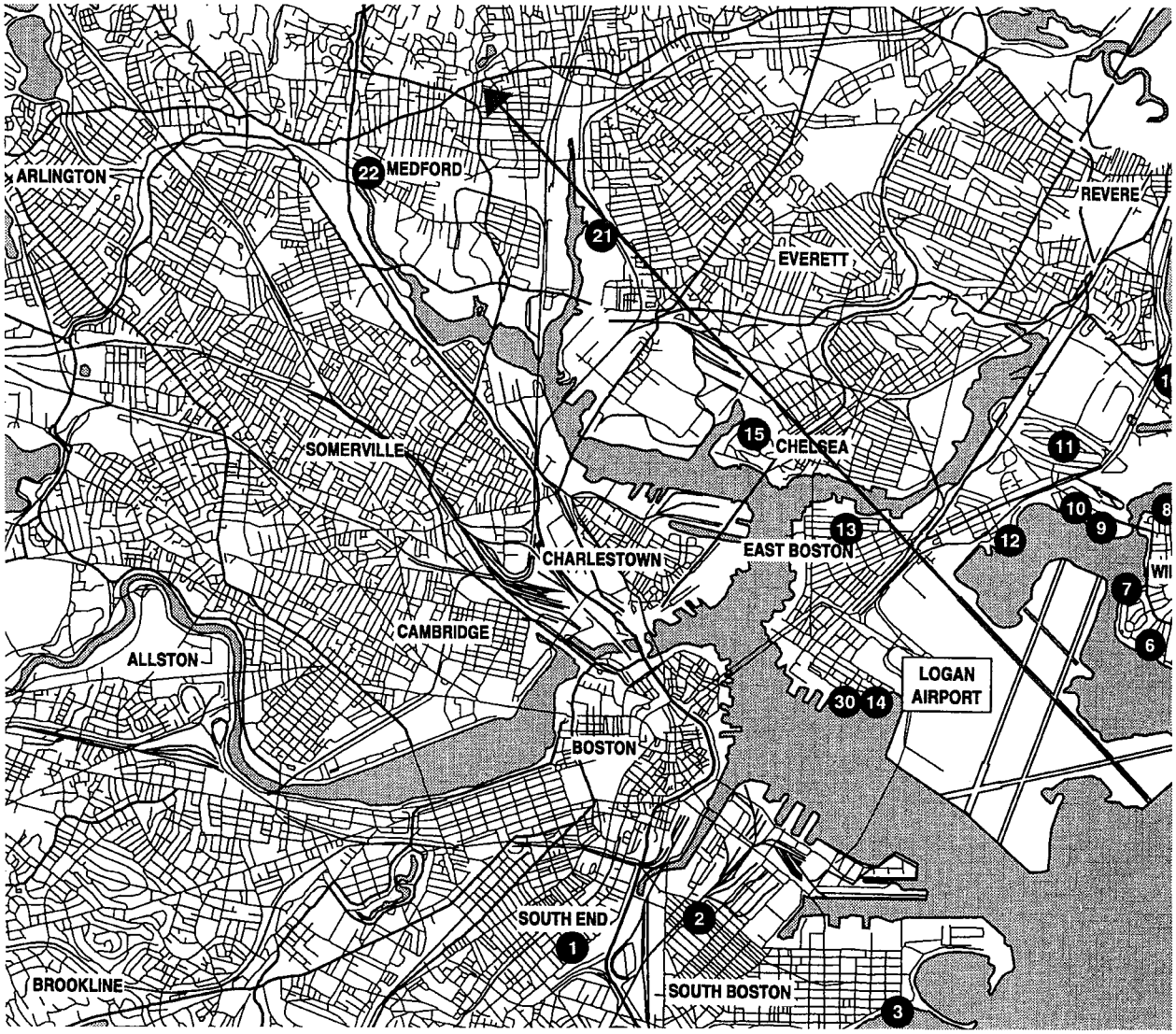

Figure 1. Approximate position of Logan noise monitors (After Logan 1999 ESPR). In particular, note the 4 monitors that are situated northwest of the airport generally along the extension (heavy red line) of takeoff Runway 33L. These monitors are 13 (East Boston), 15 (Chelsea), 21 (Everett), and 22 (Medford).

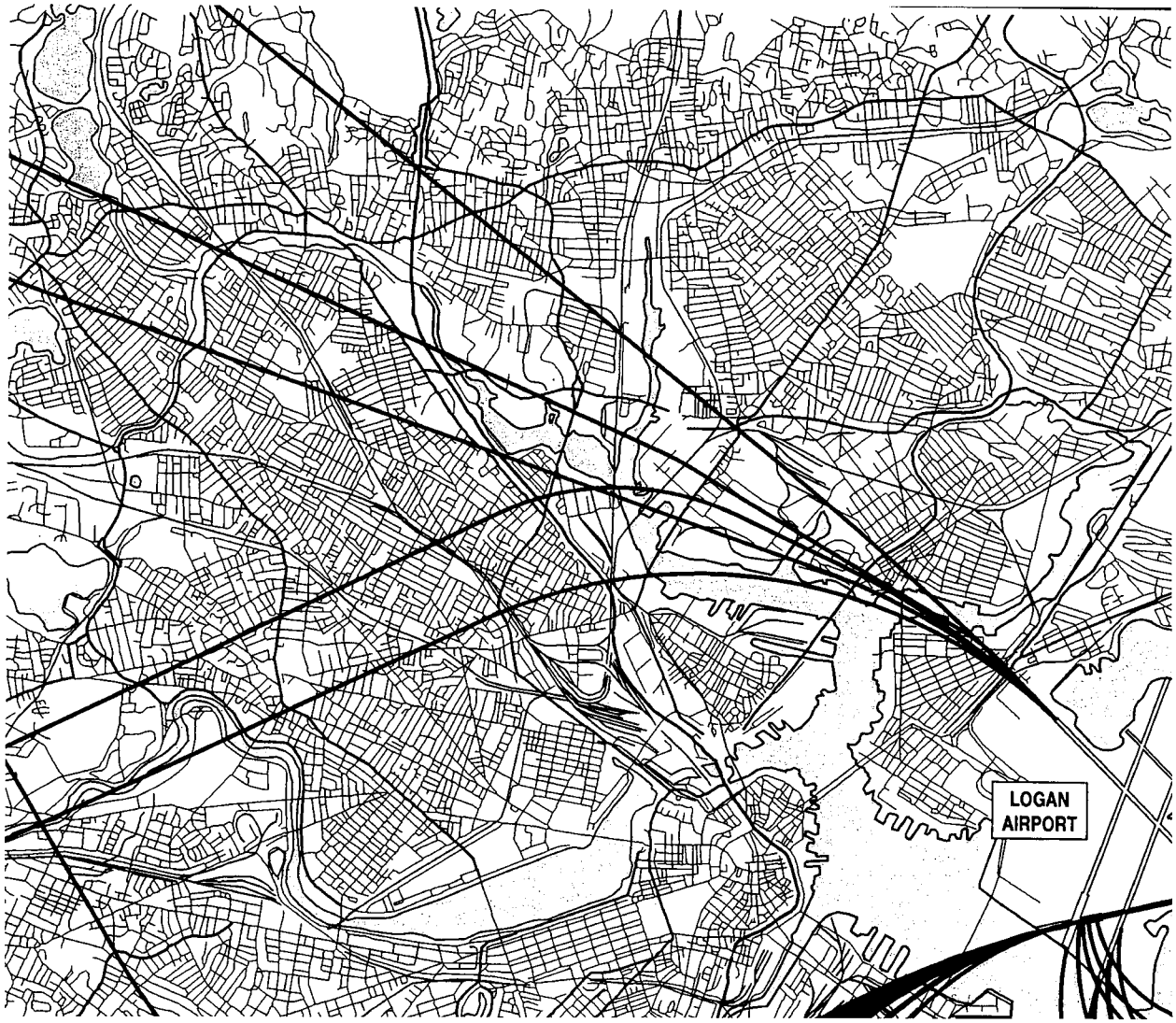

Figure 2. Jet aircraft takeoff flight tracks for aircraft taking off on Runway 33L (After Logan 1999 ESPR).

2. Numbers of Commercial Jet Takeoffs to the Northwest

Yearly jet aircraft takeoffs can be calculated from data contained in the Logan 1999 ESPR. In particular, Table 6-1 of the 1999 Logan ESPR lists daily commercial jet operations and Table 6-3 in the same report lists runway usage (percentages) for 1990 and 1992 through 1999. Table 1 herein lists the calculated yearly numbers of commercial jet takeoffs on Runway 33L for the years from 1994 through 1999. These numbers are calculated from the Logan 1999 ESPR tables cited above. Note: operational data for 1991 are not given in the Logan 1999 ESPR and 1992 and 1993 lack monitor data for Chelsea, so only 1994 and on are listed.

Year	Commercial Jet Takeoffs on Runway 33L
1994	6278
1995	6032
1996	5995
1997	6442
1998	6643
1999	8607

Table 1. Annual commercial jet takeoffs on Runway 33L by year. (Calculated from data in the Logan 1999 ESPR.)

3. Complaints

Yearly numbers of noise complaints have been summarized by community, and published by the noise office at Logan Airport for every year since 1976. . Table 2 lists the Logan noise office registered numbers of complaints in Somerville and Everett by year from 1994 through 1999, the years for which there also is complete noise monitor data and runway usage data.

Year	Somerville	Everett	Total
1994	13	0	13
1995	15	4	19
1996	16	24	40
1997	5	28	33
1998	68	22	90
1999	239	58	297

Table 2. Complaints by year. (From Logan noise office published data.)

4. Purpose

The purpose of this paper is to:

a. Examine and validate the noise monitor data

b. Examine the relationship between complaints and noise levels near Somerville

c. Examine the relationship between numbers of takeoffs and noise levels near Somerville

d. Examine the relationship between complaints and numbers of takeoffs near Somerville.

II. ANALYSIS OF NOISE MONITOR DATA

1. Correlating the Noise Monitor Data with One Another

As noted above, unattended noise monitor data can be corrupted by non-airport noise. However, with 4 monitors almost in a line, several tests can be performed to test the validity of the data. First, the DNL should decrease with distance from the airport. East Boston should be the loudest site and Medford should be the quietest. Second, only the airport noise generated by takeoffs on Runway 33L is common to these 4 monitor sites. Therefore, if the yearly DNL at these 4 sites track with one another (correlate), then this is a strong indication that these monitors primarily are measuring aircraft noise. Table 3 lists the 1994 through 1999 total yearly average measured DNL at the 4 sites indicated.

Year	East Boston	Chelsea	Everett	Medford
1994	65.4	67.0	60.2	59.6
1995	66.4	67.2	60.6	60.2
1996	66.5	68.5	60.7	60.0
1997	67.1	67.6	61.0	60.7
1998	66.9	67.0	61.2	60.4
1999	66.7	67.1	61.2	61.2
Average	**66.5**	**67.4**	**60.8**	**60.4**

Table 3. Measured yearly DNL. (From Logan noise office published data.)

The first item one can note in Table 3 is that the average DNL for Chelsea is higher than the average for East Boston, but that the average levels for Somerville and Everett are in correct order. Figure 3 shows the data of Table 3 plotted by year. One can note that three of the sites, East Boston, Everett, and Medford appear to track with one another but the data for Chelsea do not track with the other three. For example, in 1996 the data for Chelsea are highest whereas the other three sites are highest in 1999. In mathematical terms, we are suggesting that the yearly data for East Boston, Everett, and Medford correlate with one another but that the data for Chelsea do not correlate with the other three. If these correlations exist, then this is a strong indication that these three sites primarily are measuring aircraft noise.

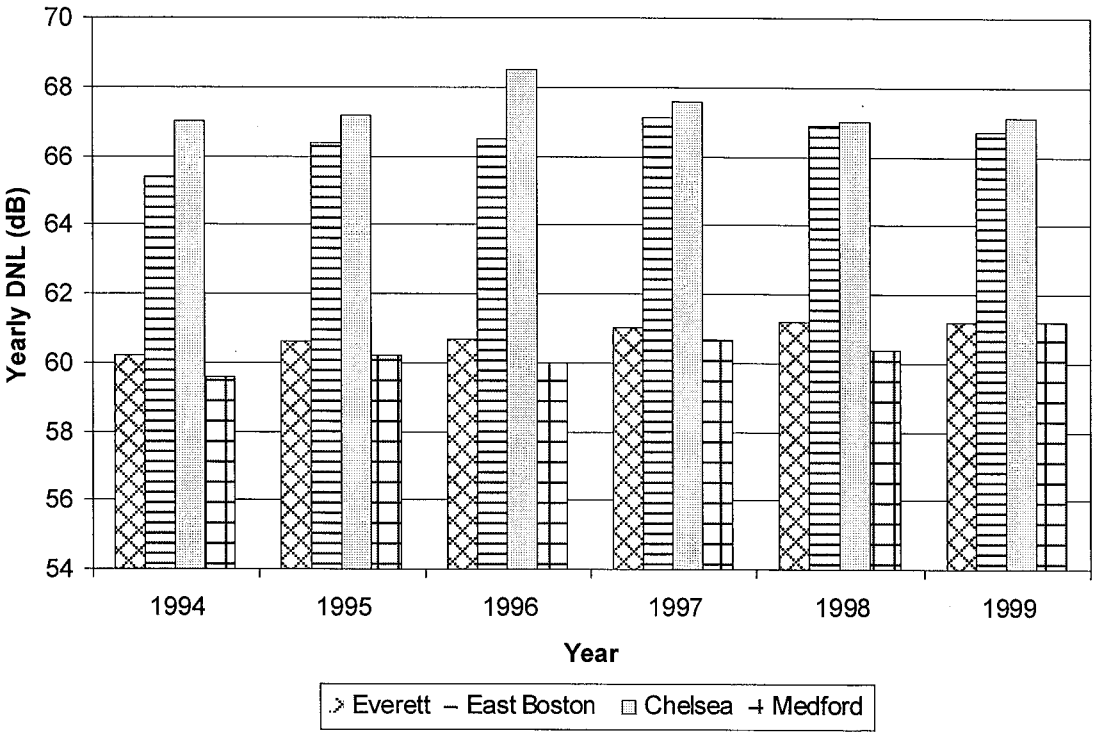

Figure 3. Yearly DNL for the sites indicated by year

Since our primary purpose is to study the airport noise in Somerville, Table 4 lists the correlation between the Everett Site (the closest site to Somerville) and the other sites. This table also lists the correlations between the Chelsea Site and the other sites. The data in Table 4 clearly show that the data gathered by the East Boston, Everett, and Medford monitoring sites are well correlated but that the data gathered by the Chelsea site is not correlated with the data from the

3 other monitoring sites. Based on Table 3, the Chelsea site levels are too large and do not primarily result from aircraft noise. In contrast, the East Boston, Everett, and Medford data all descend in order and are correlated with one another. Therefore, the data for these three sites primarily reflect airport noise.

	East Boston	Chelsea	Everett	Medford
Everett	**0.889**	-0.061	1	**0.865**
Chelsea	0.207	1	-0.061	-0.160

Table 4. Correlation of Everett and Chelsea DNL with each of the sites.

2. Correlating Complaints with the Yearly DNL—The Noise Monitor Data

Table 5 lists the yearly DNL measured by the Everett noise monitor and yearly total complaints in Somerville, Everett and the two communities together (from Table 2). This table also gives the correlation coefficients between DNL and complaints as indicated. Clearly, the complaints are correlated with the yearly DNL. This correlation further indicates that the monitors (except Chelsea) primarily are measuring airport noise.

Year	DNL	Somerville	Everett	Total
1994	60.2	13	0	13
1995	60.6	15	4	19
1996	60.7	16	24	40
1997	61	5	28	33
1998	61.2	68	22	90
1999	61.2	239	58	297
Correlation with DNL		0.5921	0.7922	0.6453

Table 5. Correlation of complaints with measured DNL.

3. Correlating the Yearly DNL (The Noise Monitor Data) with the Yearly Number of Commercial Jet Takeoffs on Runway 33L

Table 6 lists the yearly DNL measured by the Everett noise monitor and yearly number of commercial jet aircraft takeoffs on Runway 33L (from Table 1). Clearly, the numbers of takeoffs are correlated with the yearly DNL. This correlation further indicates that the monitors (except Chelsea) primarily are measuring airport noise. The DNL should correlate best with 10*log(number of takeoffs) rather than with just the number of takeoffs. So Table 6 also includes the quantity 10*log(number of takeoffs). As Table 6 shows, the correlation is

marginally better with the 10*log(number of takeoffs) quantity. This correlation further indicates that the monitors (except Chelsea) primarily are measuring airport noise. A "best fit" line fit to these data suggests that the DNL increases by 2.3 dB for each doubling of operations. This increase is slightly low compared to the DNL formulation but is an acceptable finding considering the small sample involved.

Year	Yearly DNL	Log Number	Number
1994	60.2	38.0	6278
1995	60.6	37.8	6032
1996	60.7	37.8	5995
1997	61.0	38.1	6442
1998	61.2	38.2	6643
1999	61.2	39.3	8607
Correlation		**0.6106**	**0.5971**

Table 6. Correlation of number of commercial jet takeoffs with measured DNL

III. CORRELATING COMPLAINTS WITH NUMBERS OF OPERATIONS

Table 7 compares the yearly number of commercial jet takeoffs on Runway 33L with the yearly number of complaints. Calculations show that complaints marginally correlate better with the number of takeoffs than with 10*log(number of takeoffs) so only the number of takeoffs are shown in Table 7. The correlation between number of complaints and number of takeoffs is quite high—at least for these communities and these years. Figure 4 shows the total complaints for Somerville and Everett together compared with the total number of commercial jet takeoffs on Runway 33L. This figure suggests that if the takeoffs double or triple then the number of complaints will increase by a like ratio.

Year	Yearly Commercial Jet Takeoffs on Runway 33L	Somerville	Everett	Total
1994	6278	13	0	13
1995	6032	15	4	19
1996	5995	16	24	40
1997	6442	5	28	33
1998	6643	68	22	90
1999	8607	239	58	297
Correlation		**0.9768**	**0.8577**	**0.9791**

Table 7. Correlation of number of commercial jet takeoffs on Runway 33L with measured DNL

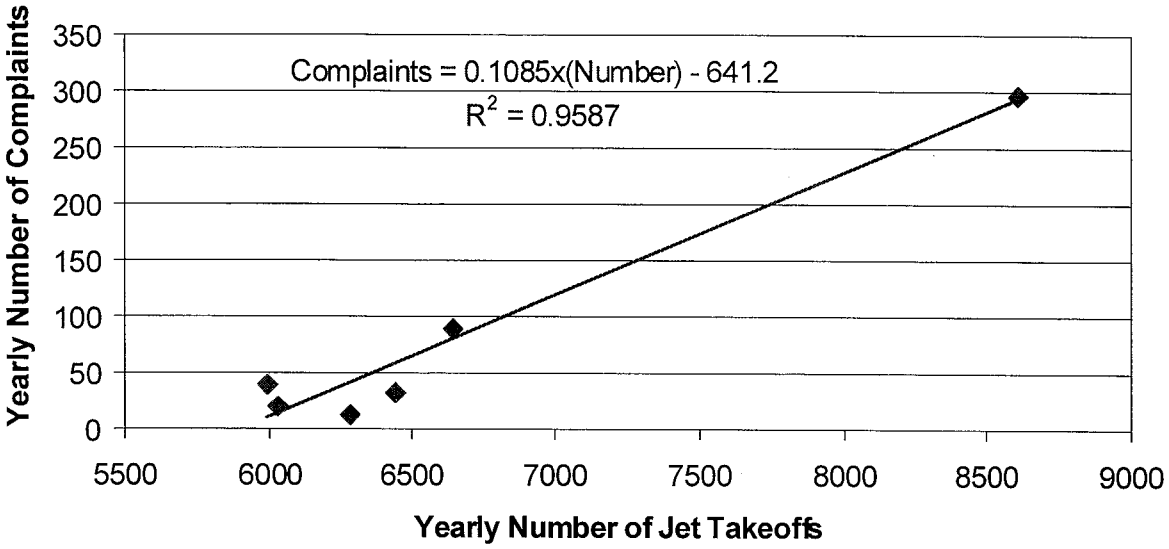

Figure 4. Complaints by Somerville and Everett as a function of the measured DNL at Everett.

III. CONCLUSIONS

1. The noise monitors at East Boston, Everett, and Medford primarily are measuring airport noise. This is evidenced by the systematic decrease in levels with distance from the airport, the year to year correlation of the levels with one another, the correlation with numbers of commercial jet takeoffs on Runway 33L, and the correlation with complaints. In contrast, the monitor at Chelsea is measuring levels that are too high and appear to be greatly influenced by local, non-airport noise sources.

   Analysis of the noise monitor data from Hull[1], another monitor that primarily measures airport noise, suggests that the true levels of airport noise are within 2 dB of the levels registered by the noise monitors.

2. Complaints from Somerville and Everett correlate positively with the yearly DNL measured by the Everett noise monitor.

3. The yearly DNL measured by the Everett noise monitor grows substantially with the number of commercial jet aircraft takeoffs on Runway 33L. This result is just as predicted by the DNL metric formulation.

4. Complaints from Somerville and Everett correlate positively with the number of commercial jet aircraft takeoffs on Runway 33L. If the number of takeoffs triples, then this result suggests that the number of complaints will triple.

[1] A companion report entitled: Analysis of Airport Noise Monitoring at Hull, MA, May 31, 2001

Baker Braverman Barbadoro William P. Golden, Esq.

Code	Topic 1	Topic 2	Comment	Response
17.1	Runway 14/32	Insufficient Design	Massport has failed to provide any airspace design or analysis which would delineate how aircraft would land and take off from Runway 14/32 and other operating Runways at Logan when Runway 14/32 is in use. Without such design and analysis it is impossible to determine where aircraft would fly or how frequently they could take off or land, and therefore, it is impossible to determine delay reduction benefits, noise impacts or air emissions.	The runway configurations involving Runway 14/32 and other operating runways are depicted in Appendix H of the Draft EIS/EIR and Appendix D of this Final EIS. Flight tracks to and from existing runways are all unchanged from present operations. Flight tracks to and from Runway 14/32 are presented in the Draft EIS/EIR and the Supplemental DEIS/FEIR. These flight tracks are sufficient to determine the environmental impacts.
17.2	Runway 14/32	Insufficient Design	Massport has failed, contrary to the requirements of 301 CMR 11.07(4)(e)(3), to provide adequate coordinates for the location of Runway 14/32 (See Figure 1.1). Since the orientation of Runway 14/32 could vary in orientation by up to 8 degrees, these coordinates are necessary to determine the airspace design and environmental impacts of Runway 14/32.	Final coordinates of the runway are not established until the final engineering design. As described in the Draft EIS/EIR, Section 3.2.2, and Supplemental DEIS/FEIR, Section 3.2.2, several layout options were considered at the outset of the Airside Project. The selected option is shown in detailed to-scale drawings, overlaid on expanded sections of the Airport Layout Plan. Any variation in orientation from this layout and the final design will be a fraction of a degree, and would have no material impact on the air quality or noise analyses. These layouts are sufficient to determine the environmental impacts. The changes in noise exposure resulting from the proposed new runway are primarily due to differences in runway use projected to occur under the various fleet and delay assumptions evaluated in the Supplemental DEIS/FEIR, not on the exact orientation of proposed unidirectional Runway 14/32.
17.3	Runway 14/32	Insufficient Design	Massport has failed to present the location and description of what navigational aids will be used for landings and takeoffs on Runway 14/32. Without such information it is impossible to determine where the actual flight paths and impacts of those aircraft which utilize Runway 14/32.	As described in the Draft EIS/EIR and the Supplemental DEIS/FEIR, the primary use of Runway 32 will be in visual conditions, and the primary delay reduction benefits occur under these weather conditions. The runway will not be a precision runway, and neither takeoffs nor visual approaches require any navigational aids. During the transition to wide-spread GPS approaches, an instrument landing system (ILS) localizer and glideslope were planned for Runway 32 to allow stabilized approaches to a minimum ceiling of 400 feet and a minimum visibility of 3/4 mile. While a practical near-term location for the localizer has not yet been determined, FAA has accelerated the development of GPS approach procedures for Runway 32. The FAA believes that approach minimums to 400 foot ceilings with 3/4 mile visibility are reasonably foreseeable with GPS approaches in the longer-term. Refer to Appendix G of this Final EIS for more information. It is important to note that all aircraft approaching Runway 32 will be aligned along the extended runway centerline within areas of significant noise (65 DNL) and that these areas are over Boston Harbor. Refer to the noise contour for the Preferred Alternative, Figure 6.2-8 in the Supplemental DEIS/FEIR. Runway 14 departure flight tracks were modeled in the Supplemental DEIS/FEIR and show departures over Boston Harbor.
17.4	Runway 14/32	Flight Tracks	Massport has failed to disclose how fixed wing aircraft can land on Runway 14/32 based on the approach which is set forth in Figure 5.2-2 on page 5- 17 of the SDEISDEIR, when such an off center approach can only be used today by helicopters.	The statement is incorrect. The final approach path will be parallel to that for Runway 33L, and will involve a slight “dogleg” turn to the left for landing. This is a very common procedure for visual and non-precision instrument landings by fixed-wing aircraft.
17.5	Regional Jets	Runway 14/32 Utilization	Massport has failed to disclose minimum landing requirements for regional jets as set forth in airline specific operating manuals.	Federal Aviation Regulation (FAR) landing distances are established by the aircraft manufacturer and certified by the FAA. These are incorporated into individual airline operating manuals. The FAR landing distance of all regional jets under maximum landing weight, zero wind and standard temperature is

Code	Topic 1	Topic 2	Comment	Response
				less than 5,000 feet; it is reduced further under lower weights and when landing into a wind (proposed Runway 32 will primarily be used with a Northwest headwind). Specific regional jet landing distances are also contained in Appendix C of the Supplemental DEIS/FEIR, and in Section 3.3.3 of this Final EIS.
17.6	Fleet Mix/ Forecasts	747s	Massport has failed to disclose how it determined in its 37.5M High RJ fleet mix that regional jets will replace 747s and reduce scheduled flights of 747s in 2015 from 20 to 2 per day.	The 37.5M High RJ forecast does not assume that regional jets will replace 747s, so the changes are not related. The 747 has very different capabilities and serves very different markets than the regional jet. The 747 is capable of flying long-range (up to 7,000 nautical miles), overwater missions, such as transatalantic service to Europe, while RJs have a maximum operating range of approxiamtely 1,000 nautical miles. Many of the 747s in service at Logan Airport today are older aircraft that will be retired from service by the year 2015. The forecast development considered these aircraft retirements. The 37.5M High RJ Fleet assumes that other long-haul aircraft (such as the 767, the 777, the A330, and the A340) will replace retiring 747s, while the growth in regional jets reflects replacement of turobprops and small narrow body jets as well as new market entry.
17.7	Regional Jets	Fleet Mix	Massport has failed to disclose that 75% of its 1999 scheduled regional jet flights were CRJ-200, which will not use a 5000-foot runway.	While the CRJs were the first regional jet (RJ) type introduced at Logan Airport and were the dominant RJ type in the 1999 fleet, the RJ distribution has changed significantly since then as new regional jet types have entered Logan Airport service. This change was fully anticipated by Massport and the FAA during the development of the 37.5M High RJ fleet scenario. In August 2001, CRJs represented only 14 percent of scheduled Logan RJ operations, and the 37.5M High RJ fleet assumes that CRJs will represent 20 percent of future RJ operations. Refer to Section 3.3 in this Final EIS for a discussion of regional jets and the utility of Runway 14/32.
17.8	Regional Jets	Forecast	Massport has failed to disclose the increased number of regional jets and the decreased number of turboprop aircraft for any benchmark other than its 37.5M High fleet mix.	The Supplemental DEIS/FEIR presents the number of turboprop and regional jet operations for each fleet that was analyzed (refer to Section 4.2.4). All of the fleets are also presented by aircraft type in Appendix D of this Final EIS. The forecasts developed for the Draft EIS/EIR were intended to represent a range of future fleet development scenarios, and this range was expanded to include the 37.5M High RJ fleet during the Supplemental DEIS/FEIR process. The 15,000 annual regional jet operations in the 29M Low fleet and the 184,000 annual regional jet operations in the 37.5M High RJ fleet effectively bracket any expected future level of regional jet operations. The 37.5M High RJ fleet was specifically developed to analyze how the recent growth in regional jet aircraft would impact the Airside operational and environmental analyses. The analysis of this high regional jet scenario produced results that were similar to the analysis of the original fleet forecasts, and still clearly demonstrated the benefits of the Preferred Alternative. In addition, a near-term 29M RJ fleet was analyzed in this Final EIS to examine the near-term impacts of regional jets. The 29M RJ fleet falls between the 29M Low and 37.5M High RJ fleets in terms of the number of regional jet aircraft. The results of the 29M RJ analysis, as described in Section 3.4 of this Final EIS, are consistent with the findings of the Draft EIS/EIR and Supplemental DEIS/FEIR, i.e., the Preferred Alternative produces substantial delay reduction benefits and reduces the number of people exposed to the highest noise levels (i.e., exceeding 70 and 75 dB DNL).
17.9	Air Quality	Alternative 1 vs. Alternative 1A	Massport has failed to disclose an air emissions inventory or air quality analysis for the Preferred Alternative. Massport has presented false air emissions comparisons between the Preferred Alternative and the No Build Alternative.	In the Draft EIS/EIR and the Supplemental DEIS/FEIR, a single air quality analysis was used to represent both Alternatives 1 and 1A. The difference between Alternatives 1 and 1A relates to the removal of a varying number of non-jet operations from the Logan Airport fleet through Peak Period Pricing. These impacted operations produce extremely low levels of air emissions compared to larger jet aircraft. The air quality modeling performed to represent both Alternatives 1 and 1A was based on the complete Logan Airport fleet activity as represented in the Airside forecasts and included none

Code	Topic 1	Topic 2	Comment	Response
				of the cancellations that would result from Peak Period Pricing. It therefore represented the level of activity in the Preferred Alternative (all improvements except Peak Period Pricing). Of all of the Airside fleet scenarios, the 37.5M High RJ Fleet would have the greatest potential variation between Alternatives 1 and 1A in terms of air emissions since some regional jet cancellations were assumed in the Peak Period Pricing analysis. Even under this fleet scenario which would show the greatest variation, there would be only a 1 percent difference in NOx and VOC emissions between Alternatives 1 and 1A.
17.10	Air Quality	Emissions Inventory	Massport has underestimated air emissions inventories by as much as 150%.	Air emissions have not been understated. The air quality modeling presented in the EIS uses EPA-approved methodologies which incorporate reasonable conservative assumptions about aircraft air emissions factors.
17.11	Air Quality	SIP Conformity	Massport has failed to include a SIP conformity determination, even though Logan is a major source of NOx in an Air Quality Control Region which has been designated a serious ozone nonattainment area and new, more stringent ozone standards have been established.	Because the Preferred Alternative reduces NOx and VOC emissions when compared to the No Action Alternative and therefore complies with the SIP, general conformity determination under the Clean Air Act is not required.
17.12	Air Quality	PM 2.5	Massport has failed to disclose such material facts as actual PM-2.5 monitoring data and project related PM-2.5 emissions even though more stringent standards have been established as recently upheld by the United States Supreme Court.	In all cases, the Preferred Alternative has less air quality impacts than the No Action Alternative. Particulate Matter (PM) emission factors for aircraft are nonexistent in most cases. As a conservative, worst-case assumption, the air quality analysis assumed that all PM is less than 10 microns in diameter. No emission factors or approximation methods are available for PM-2.5. Massachusetts Department of Environmental Protection (DEP) established a PM-2.5 air monitoring program in 1999 with three monitoring stations located in the Boston area. It will take three years of data in order to determine if the PM-2.5 standards will be met. The most recent data is reported by DEP and reproduced annually in the ESPR for Logan Airport and filed annually with EOEA.
17.13	Air Quality	Long-Range Transport/ Class 1	Massport has failed to disclose air emissions impacts on Long-Range Transport and Class I Areas.	In accordance with FAA guidelines for conducting air quality analyses for airport projects, aircraft emissions were evaluated to an altitude of 3,000 feet (a distance of about 4 miles from the runway ends). Above this height and beyond this distance, there is no discernable ground-level impact from airport emissions or the long-range transport of aircraft exhaust. Finally, there are no Class 1 Areas (designated under the federal Clean Air Act) in the vicinity of Logan Airport.
17.14	Air Quality	HAP emissions	Massport has failed to disclose HAP emissions.	Emissions of volatile organic compounds (VOCs) and particulate matter (PM) can be used as surrogates for hazardous air pollutants (HAPs). Because both VOCs and PM emissions are less with the Preferred Alternative when compared to the No Action Alternative, it can reasonably be inferred that HAPs are also less.
17.15	Noise	Analysis Methodology	Massport has failed to establish a consistent factual baseline for calculating noise impacts, using different years for different calculations in order to underestimate noise impacts.	Comparing the Action Alternatives to the No Action Alternative within the context of each projected fleet provides an appropriate basis for evaluating the relative impacts of each Action Alternative. This does not distort the conclusion as to the relative impact of each scenario, but to the contrary, provides a basis for judging the effects of each alternative on delay and runway use and in turn examining the noise impacts. Within any fleet scenario, all noise analyses were entirely consistent. While the historic 1998 scenario used actual 1998 weather, the Draft EIS/EIR forecast scenarios used ten-year weather (1981-1990), and the new 37.5M High RJ and 29M RJ scenarios used updated three-year weather (1997-1999), all other analysis assumptions remained the same across all fleets and alternatives. Thus, the methodology for calculating noise impacts was consistent for all scenarios.

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17.16	Noise	Actual vs. Modeled	Massport has failed to use actual monitoring data from 1993 and 1999 to calibrate/validate the accuracy of its INM results, thereby underestimating actual noise impacts by up to 900%.	FAA has concluded that the INM does not understate actual noise impacts from airport operations. Noise monitoring is not needed to "calibrate/validate" the accuracy of the INM. Nevertheless, in response to public comments on earlier documents, Massport updated the Supplemental DEIS/FEIR to show 1998 operations data and noise contours, and specifically reported a comparison of measured and modeled noise exposure levels obtained from its permanent noise monitoring system for that year. 1998 was the most recent year of data available at the time the Supplemental DEIS/FEIR was updated. The comparison of measured and modeled DNL levels is included in Section 5.2.5 of the document and is clearly titled as such. It states that at monitoring sites located in areas where the noise is greater than 60 dB DNL, the difference between the measured noise due to aircraft and the modeled noise of aircraft differs by an average of only 0.4 decibels. These measured results show high correlation with noise model calculations. 1999 data have since been published in the Logan Airport 1999 ESPR and show comparably good agreement. Based on this comparison, it seems extremely unlikely that model calibration for 1993 and 1999 would increase noise impact estimates by up to 900 percent.
17.17	Noise	Flight Tracks	Massport has failed to utilize actual radar tracks to validate projected flight paths, thereby underestimating noise impacts on the South Shore, Somerville, Everett, Winthrop and other communities.	This statement is incorrect. The Supplemental DEIS/FEIR did utilize radar data to determine flight tracks for purposes of noise modeling. Section 5.2.3.2 of the Supplemental DEIS/FEIR states that – "The flight tracks used in the INM are derived from radar tracks obtained by the Noise Abatement Office at Massport from the FAA's Automated Radar Terminal System-3 (ARTS) radar at Logan Airport."
17.18	Noise	Monitors	Massport has failed without any explanation to disclose monitoring data from 8 of its noise monitors.	Page 5-24 of the Supplemental DEIS/FEIR provides explanation for why the eight Massport noise monitoring sites were not used for the Airside Study. Five of the eight are at large distances from any runways. While they pick up noise from Logan Airport operations, they are not consistently overflown by aircraft. Community-based sources contribute significantly to the total measured exposure at these locations, and Massport's noise and operations monitoring system has difficulty isolating the contribution of exposure caused by aircraft -- a factor that makes it difficult to make reasonable and accurate comparisons between measured and modeled exposure levels. The remaining three locations had not yet been installed at the time the Airside Project was initiated. Noise data from all eight of the sites referenced are documented annually in ESPR/EDR environmental reports submitted by Massport to the Massachusetts Secretary of Environmental Affairs.
17.19	Noise	INM Model	Massport has failed to disclose why its INM generated noise contours for landings are not aligned with radar flight tracks, existing navigational aides and existing and proposed runway orientations.	The INM generated noise contours for landing are properly aligned with radar tracks, navigational aides, and/or runways. The contours are not always directly aligned with the runways because: (a) aircraft departures from Runways 22R, 22L, and 33L turn left immediately after takeoff and create a bend in the contours, partially masking the effect of landing aircraft; (b) flight paths are different between the 1998 modeled contours and the future contour sets. One such difference is identified on page 6-32 of the Supplemental DEIS/FEIR which describes the modeling of the Runway 27 departure procedure for the Airside Project and compares it to the modeling done for subsequent GEIR's and Annual Updates.
17.20	Noise	INM Model	Massport has failed to disclose noise impacts from aircraft at elevations over 1000 feet.	The FAA's Integrated Noise Model includes noise from aircraft as they climb well above 1,000 feet in elevation. Noise is computed as each aircraft climbs to 10,000 feet above field elevation. The noise exposure contribution from this activity is included in the generation of the noise contours. However, once the aircraft are that high in the air, the noise levels are low enough that they rarely affect noise contours.

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17.21	Noise	55dB DNL	Massport has failed to disclose noise impacts based on the 55 dB DNL metric as accepted by all agencies and boards, standard setting bodies and international organizations, with the exception of the Federal Aviation Administration and the Department of Defense.	The FAA as well as the Federal Interagency Committee on Aviation Noise (FICAN, a special government committee which includes among its members the U.S. EPA and HUD) recognize a DNL of 65 dB or above as indicative of significant noise impact. Nevertheless, the Supplemental DEIS/FEIR and prior related documents incorporated DNL contours and population counts down to 60 dB. Both Massport and the FAA believe it is most appropriate to reduce noise in the most heavily impacted areas first, and the Preferred Alternative provides the opportunity to reduce noise exposure to the population exposed to the highest noise levels above DNLs of 75 dB and 70 dB. Refer to Tables 5.2-3 and 6.2-5 through 6.2-7 of the Supplemental DEIS/FEIR for population data down to DNL values of 60 dB. Also, refer to newly included and newly excluded populations attributable to the Preferred Alternative in Tables 6.2-8 through 6.2-9 of the Supplemental DEIS/FEIR.
17.22	Alternatives	PPP vs. 14/32	Massport has failed to consider the environmental benefits of immediate implementation of Peak-Period Pricing and the negative environmental impact of delay in Peak-Period Pricing until after the construction of Runway 14/32.	Alternatives 2 and 3 include Peak Period Pricing but do not include Runway 14/32. By comparing Alternative 2 (all proposed actions except Runway 14/32) with the No Action Alternative, the environmental benefits of Peak Period Pricing can be determined. The environmental effects of Alternative 2 were presented in Chapter 6 of the Draft EIS/EIR and in Appendices E and F of the Supplemental DEIS/FEIR. These results were carefully reviewed and considered when selecting the Preferred Alternative. Chapter 6 of the Supplemental DEIS/FEIR presented the 37.5M High RJ environmental results for Alternatives 2 and 3. Peak Period Pricing is not a substitute for Runway 14/32 in that these two options deal with very different sources of delay. Peak Period Pricing or an alternative demand management mechanism addresses delays that occur if airlines schedules exceed Logan's normal airfield capacity. In contrast, Runway 14/32 prevents delays caused by the major drop in Logan's airfield capacity that now occurs during northwest wind conditions. The Airside EIS analysis shows that Runway 14/32 leads to a substantial reduction in delays, even with peak period pricing in effect.
17.23	Alternatives	All Alternatives	Massport has failed to compare Alternatives I, II, and III to the No Build Alternative.	The Airside Draft EIS/EIR presents the full set of operational and environmental results for all Project Alternatives - Alternatives 1, 1A, 2, 3, and No Action (Alternative 4). This information was also included in Appendices C, E, and F of the Supplemental DEIS/FEIR. For the 37.5M High RJ Fleet which was developed during the Supplemental DEIS/FEIR process, the Supplemental DEIS/FEIR compares the impacts for all alternatives.
17.24	Alternatives	No Growth Alternative	Massport has failed to consider a No Growth Alternative.	The FAA and Massport believe a No Growth Alternative is an unlikely long-term scenario. Demand for air travel is driven by economic growth, and FAA forecasts continued growth in demand nationally, within New England, and at Logan. Given this growth in demand, any No Growth Alternative would likely require an artificial constraint or cap on airport activity that would likely conflict with federal constitutional provisions, federal aviation statutes and regulations, and contractual provisions related to Federal Airport Improvement Program grants.
17.25	Alternatives	Cost-Benefit Analysis	Massport has failed to compare Peak-Period Pricing to the Preferred Alternative based on a cost benefit analysis.	The Airside Project Draft EIS/EIR and the Supplemental DEIS/FEIR documents comply with all applicable NEPA requirements and provide appropriate analytical context for assessing alternatives. A cost-benefit analysis is not required by federal law. According to 40 CFR Part 1502 Environmental Impact Statements Regarding Cost-Benefit analysis "for purposes of complying with the act, the weighing of the merit and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis…"

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17.26	Alternatives	PPP vs. 14/32	Massport has failed to compare Peak-Period Pricing to the Preferred Alternative based on a scenario where Peak-Period Pricing was implemented without Runway 14/32.	Refer to Response to Comment 17.22.
17.27	Regional	Alternatives	Massport has failed to consider, as an alternative, a regional multi-modal transportation system which decreases Logan passenger growth within the Route 495 beltway by improving passenger access to Manchester, T.F. Green, and Worcester airports.	The Airside analysis did consider the benefits of regional airports and high speed rail in reducing future demand for Logan services. Section 2.5 of the Supplemental DEIS/FEIR describes Massport's revised forecast which explicitly considers the effect of regional transportation options on Logan Airport demand. Logan is not expected to reach 37.5 million passengers until 2015, 5 years later than what Massport projected in the Draft EIS/EIR. Section 2.9 of the Supplemental DEIS/FEIR summarizes the major conclusions from several relevant planning studies that have been conducted since 1989. The regional transportation strategy that evolved from these studies includes an expanded role for regional airports and the development of high-speed rail, in addition to the construction of Runway 14/32 and other infrastructure improvements at Logan Airport. Improving the efficiency of Logan Airport is a critical component of a successful regional transportation plan because it benefits the largest segment of New England's air passenger market. Logan is the closest and the most convenient airport for the largest concentration of New England's air travel demand. Boston, including surrounding suburbs, is the single largest generator of resident air trips in New England. The greater Boston metropolitan area is also the most popular New England destination for visiting business and leisure passengers. In the last several years, the regional airports have grown and assumed an expanded role and Amtrak has initiated high-speed rail in the Northeast Corridor. Improving the efficiency of airfield operations at Logan is the only major part of the region's transportation plan that has not yet been implemented. FAA and Massport have conducted substantial analysis towards increasing utility of Providence, Manchester, and Worcester airports. The proposed Preferred Alternative provides clear benefits at recent and future traffic levels by reducing preventable delays that occur during northwest wind conditions. Northwest wind delays at Logan Airport, which inconvenience and create unnecessary costs for hundreds of thousands of air passengers each year, cannot be mitigated through regional alternatives.
17.28	Alternatives	New Technology	Massport has failed to consider new GPS/LAAS and GPS/WAAS technology as a delay-reduction alternative to Runway 14/32.	New technology was considered in the Airside Improvements Feasibility Study and subsequently in the Draft EIS/EIR. Most new technologies under development will improve safety (e.g. reduce runway incursions), or reduce delays in the enroute sector. According to the FAA Airport Capacity Benchmark Report 2001, technology and procedural improvements such as ADS-B/CDTI (with LAAS) or FMS/RNAV routes, could improve Boston capacities by approximately 4 percent. Even those technologies would have minimal benefit under northwest wind conditions when Logan is forced to operate on two or fewer runways. There are no new technologies under development which would substitute for the delay reduction benefits of Runway 14/32.
17.29	Alternatives	Push Back Restrictions	Massport has failed to consider "push back restrictions" as a delay and pollution reduction alternative.	Gate holds and delayed pushback clearances are already routinely used for departing aircraft at Logan Airport to reduce congestion and unnecessary ground idling. Under congested conditions, additional gate holding of departures would delay arriving aircraft waiting for the gates to be made available, thus resulting in even more passenger delays and no change in aircraft ground idling.
17.30	PRAS	Goals	Massport has failed to determine how PRAS goals will be updated as defined, especially since new communities have been added to the CAC since the original adoption of PRAS.	The objectives of the PRAS were defined in 1981 by a joint committee representing impacted communities, the FAA and Massport: (1) Reduce noise exposure on populations residing in the most highly impacted communities, without significantly increasing the impact on any populated area within the day-night sound level (DNL) contour of 65 dB; and (2)

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				Maximize the use of runway 15R for over Boston Harbor departures and 33L for overwater arrivals. The runway end use goals of PRAS were developed and approved by the PRAS committee to meet these objectives. As indicated in the Section 4.3.3 of the Supplemental DEIS/FEIR, the land use and population distribution around Logan have not materially changed since the goals were established. Massport has committed in the Airside Project Section 61 Findings, pursuant to the Massachusetts Environmental Policy Act, to update PRAS and will work with the CAC and the FAA, with the understanding that the current PRAS will remain in place until superseded.
17.31	Noise	Monitors	Massport has failed to provide detailed procedures and guidelines for how controllers will assign aircraft to runways under specific weather conditions in order to meet PRAS goals.	The operation of PRAS has been explained in detail in Section 5.2.4 of the Draft EIS/EIR and Section 4.3 of the Supplemental DEIS/FEIR. First, wind and weather conditions eliminate runways which cannot be used for safety considerations; second, expected hourly demand is used to eliminate configurations which have inadequate capacity; finally, if more than one configuration is available, the PRAS goals are used to recommend a preferred operating configuration.
17.32	PRAS	Runway Use	Massport has failed to disclose the proportion of such operations assigned to each runway, the methodology by which this is done or the assumptions upon which such assignments are based.	The methodology described in the Response to Comment 17.31, Section 5.2.4 of the Draft EIS/EIR and Section 4.3 of the Supplemental DEIS/FEIR has been used throughout the Airside Project analyses. The resultant runway utilization has been presented in Sections 4.5 and 6.2 of the Draft EIS/EIR and Sections 4.6, 4.7, and 6.2 of the Supplemental DEIS/FEIR. Detailed runway use statistics were also presented in Appendix H of the Draft EIS/EIR and Appendices C and E of the Supplemental DEIS/FEIR for all forecast scenarios and improvement alternatives.
17.33	PRAS	Implementation	Massport has failed to disclose why PRAS has not been implemented to date and why future implementation efforts will be any more successful than its past failed implementation efforts.	PRAS has been implemented continuously at Logan since 1981, except for brief periods when software or hardware upgrades were being made. The ability to meet the annual goals has fluctuated from year to year due to variations in wind, weather, demand and ATC procedures. As documented in the Supplemental DEIS/FEIR, Section 4.3, the ability to meet the annual goals has improved in recent years. One major obstacle has been the reduced capacity of Logan for operations during northwest winds. Runway 14/32 will remove this obstacle and enable controllers to reduce delays and to improve their compliance with the PRAS goals during northwest wind conditions, relative to the No Action Alternative.
17.34	PRAS	Implementation	Massport has failed to disclose how it plans to meet MEPA/NEPA requirements implementing PRAS and when it plans to commence a MEPA/NEPA review on its plan to implement PRAS.	PRAS is not an element of the proposed Airside Project. Along with its noise rules, PRAS is an element of Massport's noise abatement program reviewed by EOEA and presented to MEPA in the GEIR/ESPR process. PRAS has been an operational system at Logan Airport for twenty years. No additional NEPA evaluation of PRAS is warranted nor anticipated. Massport has committed in the Airside Project Section 61 Findings, pursuant to the Massachusetts Environmental Policy Act, to reevaluate PRAS in cooperation with the CAC and the FAA.
17.35	PRAS	Environmental Impacts	Massport has failed to analyze or evaluate the short-term, long-term and cumulative environmental impacts of PRAS.	An environmental analysis of PRAS is not the subject of the Airside Project. For over twenty years, PRAS has been a component of Massport's noise abatement program along with its noise rules. The environmental impacts of PRAS have been described in the ESPR process which is a cumulative environmental impact assessment addressing the overall effects of airport operations. Each historic noise assessment for the airport reflects the extent of actual compliance with PRAS, as it has affected runway use. Each projected future noise assessment for the airport reflects the assumed extent of compliance with PRAS as it is expected to affect runway use.
17.36	Delay	Modeling	Massport has failed to disclose the inner workings of its analytical models, FLAPS and DELAYSIM, making it impossible to understand, evaluate or otherwise validate the efficacy of these models.	FLAPS and DELAYSIM are described in sufficient detail to make an environmental assessment of the Airside Project Alternatives. While the "inner workings" of the models are proprietary, the input parameters used in the analysis are available from the FAA upon request. FLAPS is similar to other runway capacity/delay simulation models such as the FAA's ADSIM.

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				DELAYSIM is a sophisticated model which predicts long-term runway use and delays using real weather observations and continually varying demand conditions. The FLAPS and DELAYSIM models have been described in Chapter 4 of both the Draft EIS/EIR and the Supplemental DEIS/FEIR. These models were originally developed for use at Logan Airport and have been used in airport planning studies in the United States and internationally. Refer to Section 3.11 - Runway Capacity and Delay Modeling, and Appendix D - Capacity and Delay of this Final EIS for additional information.
17.37	Delay	Modeling	Massport has failed to disclose a concise description of the key assumptions made about capacity under the various configurations, how aircraft are assigned to operate on specific runways when these configurations are in use, and how the resultant delays, if any, have been estimated. Without such information it is impossible to determine how the specific delay estimates were prepared for the base case or any of the future scenarios developed by Massport.	A concise description of each runway configuration analyzed in the Airside Improvements project, showing runway assignments by aircraft class and weather conditions, is provided in Appendix H of the Draft EIS/EIR. As described in the Draft EIS/EIR and Supplemental DEIS/FEIR, the configuration use and delays were estimated by the DELAYSIM model using realistic variations in hourly demand and actual weather observations for ten years (Draft EIS/EIR) or three years (Supplemental DEIS/FEIR). Refer to Section 3.11 - Runway Capacity and Delay Modeling and Appendix D - Capacity and Delay of this Final EIS for additional information.
17.38	Regional Jets	Runway 14/32 Utilization	Massport has failed to disclose how projected delay-reduction will be affected if regional jets refuse to land on Runway 14/32.	The FAA performed an independent assessment of regional jet utilization of the proposed Runway 14/32 to provide appropriate assumptions for the airfield simulation and delay analysis in the Supplemental DEIS/FEIR. These assumptions are described in Chapter 4 and Appendix C of the Supplemental DEIS and were further further confirmed by MITRE. Refer to Section 3.7 and Appendic J of this Final EIS for the MITRE analysis. Using the parameters provided by the FAA, the analysis showed that Runway 14/32 would produce significant delay reduction benefits under a future fleet scenario characterized by high levels of regional jet aircraft and a substantial reduction in non-jet activity. Using the Logan specific fleet and the use assumptions provided by the FAA (CRJs cannot land on the runway, DRJs can land in all conditions and Embraers can land under dry conditions), 71 percent of Logan's future regional jet arrivals are able to land on Runway 32. In addition, a sensitivity analysis demonstrated that the majority of the delay reduction benefits would be retained, even at levels of regional jet use significantly below those identified by the FAA. For example, under the pessimistic low utilization assumptions, the sensitivity analysis indicates that 23 percent of Logan's future RJ fleet would be able to land on Runway 32, and runway delays would be reduced by over 20 percent. Refer to Section 3.3.5.1 of the Final EIS for a complete discussion of the sensitivity analysis. Furthermore, the two largest regional jet operators at Logan, American Eagle and ACJet (a Delta Connection carrier), have provided letters confirming their intentions to use Runway 14/32. Refer to Appendix F of this Final EIS for written statements from these airlines as well as other airlines and the Air Transport Association.
17.39	Regional Jets	Runway 14/32 Utilization	Massport has failed to disclose how projected delay-reduction will be affected by less than optimal conditions at Runway 14/32.	The operational/delay analysis was not based on optimal conditions, but used actual Logan weather conditions observed over many years. These conditions properly represent delays at Logan for continuously changing ceiling, visibility, wind speed and direction, and precipitation (rain, snow, sleet, etc.). Refer also to the response to Comment 17.49 concerning the runway length requirements of Regional Jets under different operating conditions.
17.40	Alternatives	PPP vs. 14/32	Massport has failed to disclose the delay-reduction benefits which would result if Peak-Period Pricing was implemented first before construction of Runway 14/32.	Alternatives 2 and 3 include Peak Period Pricing but do not include Runway 14/32. By comparing Alternative 2 (all proposed actions except Runway 14/32) with the No Action Alternative, the environmental benefits of Peak Period Pricing can be determined. The delay reduction impacts of Alternative 2 were presented in Chapter 4 of the Draft EIS/EIR and in Appendix C of the Supplemental DEIS/FEIR. These results were carefully reviewed and

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				considered when selecting the Preferred Alternative. Section 4.7 of the Supplemental DEIS/FEIR presented the 37.5M High RJ environmental results for Alternatives 2 and 3. Peak Period Pricing is not a substitute for Runway 14/32 in that these two options deal with very different sources of delay. Peak Period Pricing or an alternative demand management mechanism addresses delays that occur if airlines schedules exceed Logan's normal airfield capacity. In contrast, Runway 14/32 prevents delays caused by the major drop in Logan's airfield capacity that now occurs during northwest wind conditions. The Airside EIS analysis shows that Runway 14/32 leads to a substantial reduction in delays, even with peak period pricing in effect.
17.41	Alternatives	New Technology	Massport has failed to disclose the delay-reduction benefits which new technology will make available in the near term.	New technology was considered in the Airside Improvements Feasibility Study and subsequently in the Draft EIS/EIR. Most new technologies under development will improve safety (e.g. reduce runway incursions), or reduce delays in the enroute sector. According to the FAA Airport Capacity Benchmark Report 2001, technology and procedural improvements such as ADS-B/CDTI (with LAAS) or FMS/RNAV routes, could improve Boston capacities by approximately 4 percent. Even those technologies would have minimal benefit under northwest wind conditions when Logan is forced to operate on two or fewer runways. There are no new technologies under development which would substitute for the delay reduction benefits of Runway 14/32.
17.42	Capacity	Airside	Massport has failed to disclose its actual, sustained capacity.	Airport capacity is typically expressed in terms of the number of operations that can be handled in an hour. Capacity is a function of the active runways and respective aircraft assignments, weather and wind conditions, fleet mix, ratio of arrivals to departures, performance of individual pilots and controllers, as well as other factors. Consequently, the airport capacity will vary with fluctuations in any these parameters. The FAA Airport Capacity Benchmark Report 2001 estimated Logan's VFR capacity to be between 118 and 126 operations per hour. This is consistent with the Airside analysis that shows Logan can accommodate about 120 operations per hour approximately 80 percent of the time. Appendix D of this Final EIS contains specific capacities for Logan configurations. These operational capacities are the capacities that can be sustained for an extended period of time; over shorter periods, the operations rate can exceed these operational capacities by about 10 percent.
17.43	Induced Demand	Impacts	Massport has failed to disclose the impact of increased delays and congestion on future passenger growth, assuming falsely that, if no action was taken, historic growth rates for passengers would continue.	Logan Airport experienced passenger growth over the past decades despite increasing congestion resulting from a lack of infrastructure improvements. Passenger growth is expected to continue over the long-term in response to economic and demographic growth, whether or not the Preferred Alternative is implemented. While historic passenger growth at Logan Airport has averaged 3.1 percent annually (1980-2000), the analyses in the Airside EIS Documents assume a lower average annual growth rate of 2.1 percent (2000-2015) to reflect the continued influence of a stronger regional airport network and rail alternatives.
17.44	Capacity	Airside	Massport has failed to disclose the factual analysis and assumptions upon which it calculated that Logan has a capacity of 120 operations per hour.	As described in the Draft EIS/EIR and Supplemental Draft EIS, the runway configuration at Logan with the highest capacity uses three runways (4L, 4R, and 9). Under balanced arrival and departure flows and assuming all existing FAA separation and runway dependency standards, the operational capacity of this configuration is approximately 120 operations per hour. Depending upon the mix of aircraft types in the fleet, the capacity of this configuration ranges from 113 to 122 operations per hour. This is also consistent with the FAA Airport Capacity Benchmark Report 2001, which states that Logan has a good weather capacity (using 4L, 4R, and 9) of 118 to 126 hourly operations. Refer to Section 3.11 of this Final EIS for additional details on the modeling assumptions used for the analyses.

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17.45	Capacity	Increased Capacity	Massport has failed to disclose the actual increased capacity which it seeks to achieve through combined land and air improvements.	Planned landside improvements at Logan have no impact on the airport's airfield capacity. Although the planned landside improvements are not part of the Airside Project, they have been evaluated for their potential to cause cumulative impacts. Refer to Section 7.1 of the Supplemental DEIS/FEIR and Section 2.3 of this Final EIS. By preventing the drop in capacity that currently occurs when northwest winds force Logan to operate to the northwest, Runway 14/32 will increase the amount of time that Logan Airport can operate on three runways. It will therefore increase the average capacity of the airport. It will not, however, increase Logan's normal three-runway capacity of approximately 120 hourly operations that is available around 80 percent of the time. This capacity level is consistent with the FAA's Airport Capacity Benchmarking Report 2001, which states that Logan's good weather capacity is between 118 and 126 hourly operations and that construction of Runway 14/32 will not increase this capacity. Making Logan's normal three-runway capacity level available more often increases the reliability of the airport and reduces delays. Refer to Section 3.5 of the Final EIS for more information. Refer also to response to Comment 17.42.
17.46	Public Participation	Notice of Project Change	There has been a Notice of Project Change for the following reasons: - This comment constitutes a Notice of Project Change under 301 CMR ll.lO(1). - The Secretary may determine under 3 10 CMR 1 1.1 O(5) that there is a Notice of Project Change based on a determination that the Proponent has either knowingly or inadvertently concealed material facts and/or submitted false information during the MEPA review or that the Proponent has segmented the Project. - The Proponent filed a Notice of Project Change based on lapse of time which included misleading, deceptive and false information and which it failed to circulate in accordance with 30 1 CMR 1 1.1 O(7).	MEPA concluded review of the Airside Project and found that it adequately and properly complied with state requirements. There is no project change issue under NEPA.
17.47	Air Quality	Impacts	The changes in the Project and the lapse of time significantly increase the environmental consequences of the Project by reducing environmental and delay benefits due to change in fleet mix and by failing to demonstrate compliance with strict new ozone and particulate NAAQS even though the Project is now in a serious noncompliance area for these standards and the Proponent is identified in the SIP as a major source.	In accordance with Federal EPA guidelines, the new 8-hour ozone standard will not take effect in the Boston area until the existing 1-hour standard is met. Moreover, the emission inventory results contained in the Supplemental DEIS/FEIR indicated that the two principle precursors to ozone formation (e.g. VOCs and NOx) will be less with the Preferred Alternative when compared to the No Action Alternative. MDEP established a PM-2.5 air monitoring program in 1999 with three monitoring stations located in the Boston area. It will take three years of data in order to determine if the PM-2.5 standards will be met. The most recent data is reported by MDEP and reproduced annually in the ESPR for Logan Airport and filed annually with EOEA. There has been no change to Logan's current or forecast fleet mix that would reduce the delay reduction or environmental benefits of the Preferred Alternative. Potential changes to Logan's future fleet mix in terms of greater numbers of regional jet aircraft operations have been fully analyzed in the Supplemental DEIS/FEIR and the Final EIS. Refer to response to Comment 17.8 for more information.

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17.48	Public Participation	Notice of Project Change	The changes identified in the Notice of Project Change require the Notice to be published and comments to be received pursuant to 3 10 CMR 1 1.1 O(8) as to whether the Project warrants further MEPA review by submission of a new ENF, a Supplemental FEIR, or changes, additions or deletions to the scope.	MEPA concluded review of the Airside Project and found that it adequately and properly complied with state requirements. There is no project change issue under NEPA.
17.49	Regional Jets	Runway 14/32 Utilization	Certified landing distances are computed using the following factors: 1. Zero wind. This assumes no head wind component for a slower ground speed on landing, thus resulting in a shorter landing distance. 2. Maximum landing weight of the aircraft. The lighter the aircraft, the slower the final approach reference speed. 3. Standard day conditions. This assumes that the atmospheric pressure is 1O13.2 heeto Pascals (29.92 hg) with a temperature of 15 degrees Celsius (59 degrees Fahrenheit). 4. Dry runway. Runway contamination, such as water, ice, or snow increases the length necessary by 15%. (required for FAR 136 or 121 operations), thus further limiting regional jet operations.	Comment noted. The four factors mentioned plus runway slope and obstacle clearance requirements are the principal determinants of aircraft landing distance. Refer to the regional jet discussion in Section 3.3 of this Final EIS for more information.
17.50	Regional Jets	Runway 14/32 Utilization	Moreover, even under ideal conditions, most pilots will probably not use this runway to land regional jets, as has been demonstrated at Philadelphia and BWI.	The situations at Philadelphia (PHL) and Baltimore (BWI) are very different from the proposed Runway 14/32 at Logan. At Philadelphia the design of the 5,000 foot Runway 8/26 was originally intended to provide additional capacity under instrument conditions by separating jet and commuter operations. However, use of Runways 26 and 27L for arrivals creates a wake vortex dependency between the arrivals on 27L and the departures on 27R that adversely affects the jet capacity. Hence, the use of the 5,000 foot runway at Philadelphia actually lowers the capacity of Runway 27R. The runway provides little benefit under good weather (VFR) conditions, and a complex taxi routing and a significant down slope further decrease the runway's utility. It should also be noted that the lack of runway use is not an RJ issue. Philadelphia has significantly more turboprop operations than regional jet operations, and even these turboprops are not using Runway 8/26. All of these conditions are specific to Philadelphia and have no bearing on the utility of the proposed Runway 14/32 at Logan. The 5,000-foot Runway 15L/33R at Baltimore-Washington is an extended general aviation (GA) runway located adjacent to the GA ramp. Due to the proximity of a nearby residential area, the airport has imposed strict noise limits that explicitly prohibit any use of the runway by commercial jets. This noise rule precludes regional jet use of the BWI runway. In fact, many GA jets such as Lear 35s and Citation IIs are also restricted from using the runway, as are some turboprops such as the ATR-72.
17.51	Regional Jets	Runway 14/32 Utilization	Takeoff distances must also be examined since it is projected that when the wind is from the southeast, this runway may be utilized for departures.	Takeoff distances have been examined for the aircraft types in each of the historic and forecast fleet scenarios, and have been used to limit takeoff runway assignments. These takeoff and landing distance assumptions are also presented in Appendix D of this Final EIS. Southeasterly operations are not used very often during the daytime, and due to the capacity limitation on arrivals there are few departures from Runway 14. Under the 29M Low Preferred Alternative Scenario, Runway 14 departures accounted for less than 2 percent of equivalent departure operations.

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17.52	Runway 14/32	Constraints	There are several potential air traffic control constraints that have not been addressed in the Supplemental DEIS/Final EIR. Among the most significant are: No simultaneous precision approaches available at Logan; No proposed flight path design for Proposed Runway 14/32; and No Precision Runway Monitoring Equipment (PRM) in use at Logan.	Runway 14/32 is intended to be used primarily in good weather to provide another high-capacity 3-runway configuration for northwest operations. Runway 32 will also be capable of simultaneous but dependent arrivals with Runway 33L during instrument conditions down to an altitude of about 400 ft. The approach for Runway 32 will be parallel to the existing approach to Runway 33L, but offset from the Runway 32 centerline. A Precision Runway Monitor (PRM) is not required for this dependent approach, but would improve operational capability if available.
17.53	Noise	INM Model	It is incumbent that the Supplemental DEIS/Final EIR provide sufficient detail so that one can run the INM and test the resulting calculations and the assumptions made. The necessary data to perform this function has not been provided by Massport.	The Supplemental DEIS/FEIR and prior related documents, including technical appendices, provide sufficient detail with which to evaluate the completeness and accuracy of the noise impacts associated with the Airside Project alternatives. Refer to Sections 5.2 and 6.2 and Appendix E of the Supplemental DEIS/FEIR and Sections 5.2 and 6.2 and Appendix L of the Draft EIS/EIR.
17.54	Runway 14/32	Configurations	The Draft EIS contained a runway configuration with simultaneous landings on Runways 32 and 27, and with takeoffs on Runway 33L. This runway configuration was omitted from the Supplemental DEIS/Final EIR.	The referenced configuration (land on Runways 27 and 32, takeoff on Runway 33L) has not been omitted from the Supplemental DEIS/FEIR. All configurations studied in the Draft EIS/EIR were also analyzed in the Supplemental DEIS/FEIR. These configurations are presented in Appendix H of the Draft EIS/EIR and Appendix D of this Final EIS. The configuration is included in all modeling scenarios, but is utilized less frequently than the higher-capacity configuration with landings on Runways 32 and 33L and departures on Runways 27 and 33L.
17.55	Fleet Mix/ Forecasts	1998 Base Year	Massport presents the 1999 ESPR data, however they fail to make use of it in their analysis. The 1999 ESPR data should have been their base case, rather than the hypothetical, inaccurate 1999 29M case.	It is not clear to which data from the 1999 ESPR the comment refers to. The Supplemental DEIS/FEIR responded to the EOEA's May 9, 1999 Certificate on the Draft EIS/EIR and Supplemental Draft EIS by including data from the 1998 Annual Update as a more recent base year. The Supplemental DEIS/FEIR included delay and environmental analyses from the 1998 Annual Update to reflect recent conditions and to provide context to the delay problem at Logan Airport. The 29M Low case does not serve as a base case, but rather as a future case for which all project alternatives including a No Action Alternative were analyzed. The appropriate comparison for assessing the benefits and impacts of proposed project alternatives is a comparison of the various alternatives, including the No Action Alternative, within each future fleet rather than a comparison of alternatives in future year operating conditions to any historical year.
17.56	Fleet Mix/ Forecast	Assumptions	The Supplemental DEIS/Final EIR appears to assume that all or nearly all of the large jet aircraft fleet will be true, Stage-3, quiet aircraft. This assumption is contrary to the expressed position of the United States Government from the President on down. Massport has no basis for assuming the elimination of retrofit Stage 2 aircraft from the fleet.	Engine retrofit aircraft are classified as Stage 3 aircraft. All future scenarios include some proportion of hushkitted aircraft.

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17.57	Noise	Actual vs. Modeled	Systematic biases in the INM predictions are ignored in the Supplemental DEIS/Final EIR. On page 5-28 of the Supplemental DEIS/Final EIR, the average differences between the "aircraft only" DNLs and the INM-generated values is given as 0.9 dB. This statement is used to justify the sole use of INM predicted results. However, there are three problems with this statement. First, it is not true. Second, there are systematic biases to the differences. Third, there may be systematic biases to the determination of the "airport only" levels.	Differences between measured and modeled sound levels have been reported in Logan Airport's various GEIRs and Annual Updates for a number of years. Differences at close-in locations were significantly reduced in 1996 through modification of source levels to better account for over-water sound propagation and apparent use of higher engine power settings than are normally assumed in the noise model's database (Refer to Appendix F of the Logan Airport 1996 Annual Update). In 1998, differences between measured and modeled noise became even less when Massport upgraded its monitoring system and began to report noise caused only by aircraft -- a metric directly comparable to the DNL exposure levels predicted by the noise model. At sites having exposure levels of 60 dB or more, this improvement to the monitoring system brought the average difference between measured and modeled DNL values to within 0.4 dB. Analysis of 1999 measurements showed similarly high correlation. Massport continues to investigate possible causes for other differences (such as from hill effects) and recently received FAA approval of noise model adjustments that permit expansion of its sound insulation program to include the effects of terrain. Massport also extends eligibility lines to include boundaries that follow local streets rather than strict noise contour lines. With such improvements in the modeling process, the FAA's INM noise model used in the Airside Project noise analyses accurately represents expected noise exposure. The comment identifies several typographical errors in the text and table on pages 5-28 and 5-29 of the Supplemental DEIS/FEIR. These typographical errors did not affect the technical analyses or conclusions. The following changes should be made to those pages: (a) All references in the main text (not the bullets) should be changed to 1998 from 1999; (b) The observations regarding measured and modeled DNL values should be edited as follows: - In 1998, the average of the differences between the aircraft-only DNLs and the INM-generated values at all 29 monitoring locations was approximately 1.5 dB (measured levels averaging higher than modeled); In 1999 it was 0.9 dB. - At monitoring sites in higher noise environments where INM-computed DNL values are greater than 60 dB (and where it would be expected that measured levels are more easily identified as aircraft), the average of the differences between aircraft-only DNLs and INM-generated levels is 0.4 dB (measured values still averaging higher than computer values). In 1999, it was 0.2 dB. (c) The first sentence in the last paragraph of the page should be deleted. The paragraph should now begin "The close agreement..." (d) The fifth number in the right-most column of data in Table 5.2-5 on page 5-29 should be -0.8, not -.08.

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17.58	Noise	Discrepancies	The data presented by Massport in its various tables and contours are inconsistent throughout the Supplemental DEIS/Final EIR. 1. Critical numerical values are inconsistent in the Supplemental DEIS/FEIR from one table or figure to another. [For instance,] there are three different values for the 37.5M High RJ fleet DNL prediction at Hull in the Supplemental DEIS/Final EIR, two in tables and one in a figure. All three should be the same, however all three are different. The difference from the smallest to the largest is almost 10 dB. Similar discrepancies are present for the 37.5M High fleet.	Refer to response to Comment 17.114. Table E.2 in Volume 3 of the Supplemental DEIS/FEIR contains several values for nighttime equivalent sound levels generated by the High Regional Jet Fleet that were erroneously transposed to the incorrect site location. Site 26 at the Hull High School was one of those. The correct nighttime Leq's for that location are 46.7, 48.5, 48.3, and 46.6 dB for Alternatives 4, 1A, 1, and 2/3 respectively. The values for Hull are correctly reported in Table 6.2-25, which shows the same data, but only for Alternatives 4 and 1A. These corrected values do not alter the conclusions of the document.
17.59	Noise	Discrepancies	Table 6.2-1 versus Appendix E "Excerpt from the Airside Draft EIS/EIR". Table 6.2-1 indicates that the numbers of operations differ between Alternatives 4 and Alternative 1A (there are two lines so labeled for each fleet alternative). However, the table in Appendix E indicates that the numbers of operations are the same for Alternative 4 and Alternative 1A. This discrepancy exists for both the 29M Low case and for the 37.5M High case. Second, the numbers of operations listed in the table on Page 1 of Appendix E for the 29M Low case do not agree with either of the lines in Table 6.2-1 for the 29 M Low case. Third, the numbers of operations listed in the table on Page 1 of Appendix E for the 37.5M High case do not agree with either of the lines in Table 6.2-1 for the 37.5 M High case. The numbers of operations are fundamental to the INM predictions but are conflicting in the Supplemental DEIS/Final EIR.	Tables 6.2-1 and 6.2-2 in the Draft EIS/EIR summarized the numbers of operations and day/night splits assuming (as indicated in the sentence just above Table 6.2-1 on page 6-8 of the Draft) that there are no delays. Appendix E of the Supplemental DEIS/FEIR then repeats these two tables but without the accompanying text to help clarify the numbers. Supplemental DEIS/FEIR, Table 6.2-1 presents the breakdown of the fleet with its day/night splits, but now includes the effects of delay. As delay increases, nighttime operations go up as well. Alternative 1A, has the lowest delay has the fewest night operations. Some additional minor differences in total operations by aircraft group are due to rounding.
17.60	Delay	Cost of Delay	The Supplemental DEIS/Final EIR Fails to identify or Discuss Negative Economic Impacts. The Supplemental DEIS/Final EIR Fails to Identify or Analyze Impacts on Property Values and Municipal Tax Revenues.	The negative economic impacts referred to by the commenter are those associated with operation of the airport, not those associated with the Airside Project. The Airside Project will reduce air pollution associated with delays, more equitably distribute noise impacts in accordance with PRAS goals, direct more aircraft operations over Boston Harbor, and reduce nighttime noise compared to the No Action Alternative. These environmental and operational benefits do not cause negative economic impacts. The Airside Project Draft EIS/EIR and the Supplemental DEIS/FEIR documents comply with all applicable NEPA requirements and provide appropriate analytical context for assessing alternatives. A cost-benefit analysis is not required by federal law. According to 40 CFR Part 1502 Environmental Impact Statements Regarding Cost-Benefit analysis "for purposes of complying with the act, the weighing of the merit and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis…"
17.61	Mitigation	Sound Insulation	The Supplemental DEIS/Final EIR Fails to Consider Financial Mitigation for Impacted Communities.	Residences subjected to noise exposure in excess of 65 dB DNL as a result of the proposed Airside Project will be eligible for sound insulation at no cost to the homeowner. Refer to Section 4.1 and Appendix B in this Final EIS.

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17.62	Mitigation		The Supplemental DEIS/Final EIR Ignores Studies that Document Negative Impact of Airport Operations on Property Values. In 1994 the consulting firm of Booz, Allen and Hamilton prepared a report entitled "The Effect of Airport Noise on Housing Values" for the Federal Aviation Administration. Booz-Allen found that the effect of noise on prices was: a) Highest in moderately priced and expensive neighborhoods and b) A difference in property values equal to 18.6 percent per 1.33 percent per dB of additional quiet between properties in neighborhoods that differed only by the effects of airport operations. Massport's proposed expansion could cause property devaluation up to $500,000,000 in the Boston Metropolitan Area.	The primary objective of the Booz-Allen study cited in the comment was to determine whether a valid national level determination regarding the impact of airport noise on property values could be based on studies at individual airports. The study specifically concluded that, "no generalization can be made regarding the quantification of this impact on a nationwide basis, since there was such a wide variation in the extent of impact - from negligible to significant- and only a limited number of neighborhood pairs around a small sample of airports from the national airspace system was considered." It is inappropriate to develop a quantified estimate of property devaluation based on the analysis in this study.
17.63	Environmental Justice	2000 Census Data	The Supplemental DEIS/Final EIR Discussion of Environmental Justice Issues Fails to Include the 2000 Census Data.	The 2000 Census data regarding minority populations was not available when the Supplemental DEIS/FEIR went to print in March 2001. The Environmental Justice analysis relative to minority populations has been updated in Section 3.6 of this Final EIS to reflect Year 2000 Census data on total population, race and ethnic origin at the block level, which was released by the U.S. Census Bureau on March 21, 2001. (The Census Bureau will not begin to release comparable data on income on a state by state basis until June 2002 at the earliest.) While the Census 2000 data show that the minority population of the communities around Logan has increased, particularly in East Boston, the percentage of the population within the 29M Low 65 dB DNL contour that is minority is the same for both the No Action and Preferred Alternative. Furthermore, approximately 34 percent of the Year 2000 population within the 29M Low 65 dB DNL contour for the Preferred Alternative is minority, compared to the total Year 2000 population for Boston, Chelsea, Revere and Winthrop, which is 48 percent minority. Therefore, the Preferred Alternative does not result in a disproportionate adverse impact on minority populations. Refer to Section 3.6 of this Final EIS for additional information.
17.64	Health	Noise Pollution	The Supplemental DEIS/Final EIR Fails to include comprehensive Public Health Information.	The Preferred Alternative was chosen because it will reduce delays and will provide environmental benefits compared to the No Action Alternative. Compared to the No Action Alternative, the Preferred Alternative would orient more flights over Boston Harbor, reduce noise in the areas experiencing the highest noise impacts, and slightly improve air quality. These environmental benefits are not detrimental to the public health. The available public health studies for communities adjacent to Logan Airport were reviewed and are presented in Section 6.8 of the Supplemental DEIS/FEIR. The Massachusetts Department of Public Health is conducting a study of the relationship between air pollution and public health, focusing on respiratory and cardiovascular effects for communities within a five-mile radius of Logan Airport. In addition, Massport is conducting an air quality monitoring program in neighborhoods surrounding the airport. Monitoring results will be presented in the ESPR and annual updates. Massport has been cooperating with the Commonwealth of Massachusetts and the City of Boston on public health issues and will continue to facilitate monitoring of airport-related emissions by DEP and others, by assisting in monitoring site selection and providing agencies with air quality data, airport activity data, and meteorological data.
17.65	Environmental Justice	Requirements	The Supplemental DEIS/Final EIR must include additional Communities.	Environmental Justice guidance states that the area affected by the proposed project should be identified as a first step in the evaluation process. In the case of the Airside Project, noise was identified as the impact with the

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				broadest geographical impact, with noise contours identified out to 65 and 60 db DNL. Suffolk County was selected as a baseline for comparison in the environmental justice analysis because it represents the area potentially affected by noise impacts at 65 dB DNL associated with the proposed action. The 65 dB noise contour extends over portions of the cities of Boston, Chelsea, and Revere, and the town of Winthrop, which collectively comprise Suffolk County. In addition, a demographic baseline for the 60 dB DNL contour consisting of the communities potentially affected by the 60 dB DNL noise contour (Boston, Chelsea, Revere, Winthrop, Everett and Quincy based on Census 2000 population) was also established. The minority and low income populations within the 60 and 65 dB DNL contours were then compared to the minority and low income populations of the baseline communities to determine if there was a disproportionate impact to minority and low-income populations associated with the Preferred Action. The Environmental Justice analysis found no disproportionately high and adverse impacts to low-income and minority populations as a result of the Preferred Alternative. Refer to Section 6.8.6 of the Supplemental DEIS/FEIR and Section 3.6 of this Final EIS for additional information.
17.66	Air Quality	Odor Impacts	The Supplemental DEIS/Final EIR Fails to Properly Review Impacts - of Odors.	Volatile organic compounds (VOCs) from low-power aircraft emissions (i.e. taxi-in, taxi-out, delay and idle) are considered to be the most representative of potentially odor-causing air emissions and are modeled as a surrogate for odor emissions. The Preferred Alternative would decrease overall odor-causing hydrocarbon emissions when compared to the No Action Alternative. This is illustrated in Table 6.4-7 and Figure 6.4-5 of the Supplemental DEIS/FEIR. The dispersion analysis also indicates that the Preferred Alternative will have lower concentrations of odor-causing VOCs in areas surrounding the airport when compared to the No Action Alternative or, at a minimum, will help to keep these emissions below present-day levels.
17.67	Public Process	Public Notice	The Supplemental DEIS/Final EIR did not provide for Maximum Public Participation.	The FAA believes that the Airside Project involved an extensive public participation process that far exceeded the typical EIS public process. There was a period of extensive public review and comment during the preparation of the Draft EIS/EIR. Public comments were received on the ENF after it was filed during the summer of 1995. In the fall of 1995, several public scoping sessions were held to provide community input to the subsequent state and federal scopes for the project. To assure that the Airside analysis was conducted with awareness and input from all concerned parties, the Massport Board established the Airside Review Committee (ARC), which consists of the Community Advisory Committee (with representatives from 24 communities surrounding Logan Airport), and 11 businesses and industry organizations. Massport also funded independent consultants for the CAC to provide them with the capacity to professionally assess the analysis and conclusions of the Airside Study. Between 1995 and 1999, Massport held 16 meetings with the ARC, an additional 15 meetings with just the CAC, and several meetings with the CAC consultants. In addition, Massport made 29 presentations to elected officials, most of whom represent Logan Airport's neighboring communities, and Massport held 45 meetings with community and business leaders, reaching an audience of more than 3,000 people. During the public comment period on the Draft EIS/EIR, the FAA held two public hearings. In January 2000, in response to the FAA's review of the Draft EIS, the FAA called for preparation of a Supplemental Draft EIS to address specific issues identified by the FAA following input from a SDEIS Panel consisting of six persons. At the FAA's direction, three SDEIS Panel members were appointed by the Governor of the Commonwealth of Massachusetts and three were appointed by the Mayor of the City of Boston. Under the direction of the New England Region FAA, the SDEIS Panel convened in March of 2000 and then met at least monthly with a final meeting in December of 2000. A total of 12 meetings were held. To provide

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				the appropriate background, the SDEIS Panel was presented with an Interim Supplemental Draft EIS, the Draft EIS/EIR, answers to key letters written by members of the public, concerned agencies and public officials responding to the Draft EIS/EIR, and a series of 15 visual and written presentations from the Project's technical consulting team and other independent industry experts. As part of the SDEIS Panel process, various community groups submitted questions to the FAA through Panel Member Mary Ellen Welch. Responses to these individual questions, in addition to the hundreds of public comment letters received on the Draft EIS/EIR, were included in the Supplemental DEIS/FEIR. See Volume 3, Appendix A for responses to comments submitted by SDEIS Panel member Welch, and Volumes 4 – 11 for Responses to Comment letters on the Draft EIS/EIR. In addition, the FAA met with the CAC in December 2000 to receive their comments and requests for additional analysis in the Supplemental DEIS/FEIR. The FAA considered all comments and requests put forward by the CAC in addition to the SDEIS Panel, EPA Region 1 and other individuals and organizations in developing the scope of work for the Supplemental DEIS. Since the filing of the Supplemental DEIS/FEIR, a joint state and federal public hearing was held on April 25, 2001 at the Radisson Hotel in Boston with over 400 people attending. A Spanish translator was present at the public hearing to facilitate comments from Spanish-speaking persons. Also, the FAA, Massport, and the Airside consultants met with the CAC's consultants, representatives of the CAC, several times since 1999 to answer their questions and discuss the EIS analyses. The most recent of these meetings were held in May 2001 during the public comment period on the SDEIS.
17.68	Alternatives	PPP vs. 14/32	"It is difficult to understand why a runway investment would be a successful strategy under certain conditions of aircraft demand, but that congestion pricing would not be successful under these same conditions..."	This EIS analysis clearly shows that Peak Period Pricing is an effective delay reduction tool when airline overscheduling occurs (i.e., in the High fleet scenarios). However, Peak Period Pricing is not a substitute for Runway 14/32 in that these two options deal with very different sources of delay. Peak Period Pricing or an alternative demand management mechanism addresses delays that occur if airlines schedules exceed Logan's normal airfield capacity. In contrast, Runway 14/32 prevents delays caused by the major drop in Logan's airfield capacity that now occurs during northwest wind conditions. The Airside EIS analysis shows that Runway 14/32 leads to a substantial reduction in delays, even with peak period pricing in effect. In its Section 61 Findings, pursuant to the Massachusetts Environmental Policy Act, Massport committed to initiating the rule-making process to implement an enforceable peak period pricing program, or an alternative demand management program with comparable effectiveness, for Logan Airport. The objective of this program will be to avoid or reduce delays associated with overscheduling of Logan Airport's available capacity in good weather conditions. The goal is to have a demand management program in place before overscheduling conditions occur at Logan Airport. The FAA acknowledges that Logan Airport is one of the nation's most delayed airports and that Massport has committed to and will propose to implement a demand management program to reduce overscheduling delays. The FAA expects that any such program that is proposed for implementation will be consistent with applicable Federal law. The FAA is working with the U.S. DOT to establish national guidelines for demand management programs at U.S. airports. As part of this national effort, Logan has been selected as one of three airports to serve as a case study for U.S. airport demand management strategies.
17.69	Alternatives	PPP vs. 14/32	There is an important difference between congestion pricing and runway investment; congestion pricing does not cost very much to implement	Demand management is not uncontroversial and the economic repercussions are significant as noted by commenters on this process. The economic costs of demand management will be borne by both the airline industry and its passengers, and these economic consequences can adversely affect access to the national air transportation system from small

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				New England markets. Peak Period Pricing and unidirectional Runway 14/32 are designed to address different causes of delay. Peak Period Pricing would target delays that result from airline overscheduling, while Runway 14/32 is designed to prevent delays that occur during northwest winds. The potential impact of Peak Period Pricing on the fleet mix at Logan Airport is discussed in Section 4.5.2 of the Supplemental DEIS/FEIR. Section 4.5.3 of the Supplemental DEIS/FEIR provides an analysis of a Peak Period Pricing Exemption program.
17.70	Alternatives	Peak Period Pricing	The technical foundations for Massport's findings and conclusions are impossible to assess accurately. Massport claims to have analyzed peak-period pricing and its effects, but it is not clear how this was done.	The Airside Project Draft EIS/EIR and the Supplemental DEIS/FEIR contain analysis of Peak Period Pricing as a demand management alternative at Logan Airport. The analysis indicates that Peak Period Pricing is an effective option when airlines schedule beyond the normal hourly operating capacity of the airport and provides an assessment of the extent of the benefits from Peak Period Pricing under such circumstances. Additional analysis of Peak Period Pricing is set out in Section 4.5 of the Supplemental DEIS/FEIR. For a review of demand management policies at other U.S. and international airports, refer to Section 4.4 of the Draft EIS/EIR and Section 3.5 of the Supplemental DEIS/FEIR.
17.71	Regional	Demand	Massport misrepresents the demand for Logan Airport services. Massport does not base their demand calculations - the foundation for all of the logic underlying their justification for the Preferred Alternative - on the behavioral choices driving use of all transportation options in the region; rather they base all of their demand characteristics on samples of passengers using Logan, and segment the percentage of Logan users according to concentric circles around their facility as a proxy for "demand".	The purpose of the Airside Study is to evaluate the benefits and impacts of various project alternatives for improving the efficiency of airfield operations at Logan Airport. To assess project alternatives, the Airside Project Draft EIS/EIR adopted Logan Airport passenger forecasts for 1999 (29 million) and 2010 (37.5 and 45 million) from the Logan Growth and Impact Control Study (LOGIC), Phase II Final Report, June 1993, which describes the passenger forecast assumptions. These passenger forecasts have been used by Massport to assess future environmental impacts of Logan Airport in the Logan Airport Generic Environmental Impact Report (GEIR), 1994 and 1995 Annual Updates, and other project-specific environmental impact studies. In the Supplemental DEIS/FEIR, the passenger projections were adjusted downward by assuming that Logan Airport would not reach 37.5 million until 2015. The FAA's Terminal Area Forecasts, which project passenger enplanements for all commercial service airports in New England and the U.S., also predicts that Logan Airport will accommodate 37 million passengers in 2015. The revised forecast is based on slower passenger growth trends observed at Logan Airport as a result of growth at the regional airports and the anticipated impact of regional rail services, primarily Amtrak's Acela high-speed train service to New York. The 1999 Logan Air Passenger Survey, which found that Logan Airport attracted fewer passengers from the region outside of I-495 than it did in 1996, confirms the impact of regionalization on Logan Airport demand. Based on the survey findings it is estimated that Logan Airport attracted 3.3 million passengers from outside I-495 in 1999, compared to 4.8 million in 1996. Over the same period, total Logan Airport passengers increased from 25.1 million to 27.1 million. If the Logan Airport demand that originated from outside I-495 in 1996 grew at the same rate as demand from inside I-495, Logan Airport would have accommodated an additional 2.4 million passengers, or 29.5 million passengers in 1999 (similar to what was projected in the LOGIC Study). Instead, Logan Airport handled 27.1 million passengers in 1999. The assumptions underlying the 2015 37.5 million passenger forecast are described in the 1999 Environmental Status and Planning Report (ESPR) and Section 1.3 of the Supplemental DEIS/FEIR. Furthermore, the delay reduction benefits of the Preferred Alternative are not dependent upon the future forecast passenger level. As demonstrated in Section 4.6 of the Supplemental DEIS/FEIR, the Preferred Alternative would

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				produce significant delay reduction at recent 1998 activity levels, as well as a wide range of future forecast passenger levels.
17.72	Regional	Regional Airports	Massport presents little evidence of effective regional decentralization investment. The implementation of a single inter-modal air transport transfer station - the so-called AITC - serving only Logan Airport. A credible demand diversification strategy would distribute such centers throughout the region, connecting Metropolitan Area passengers with all regional airport centers. Not even a connection to Worcester is planned; The implementation of a new, fourth Logan Express in the North Shore, explicitly serving market areas that directly compete with Manchester airport. This is not an example of a cooperative planning effort with other airports; and the proposed construction of a rail link providing access from downtown Boston to T.F. Green. This high-cost, low volume, Boston-centric transportation project will take many years to complete, yielding benefits that, today, could be realized through the cooperative development of bus services modeled on the successful Logan Express program. The scope of this project is clearly not pertinent to the immediate needs for improved intra-regional transportation investment that Massport purportedly supports.	The FAA acknowledges that Massport's Section 61 Findings, pursuant to the Massachusetts Environmental Policy Act, contain a commitment to "Make the Logan Express Satellite parking lots and stations available on a reasonable commercial basis for third-party bus and park-and-ride connections to other regional airports, including Worcester, Manchester and Providence." See Appendix B of this Final EIS. Other innovative ground access measures to increase the use of regional airports will be explored in the upcoming New England Regional Aviation System Plan Update, which is a joint study by the FAA, Massport, MAC, the other New England state aviation directors, and the regional airports. Refer to Appendix C of this Final EIS. The purpose of ground access projects such as those cited in the comment - the AITC and additional Logan Express sites – is to reduce the number of vehicles accessing Logan Airport and to lessen the impact of Logan Airport generated traffic on surrounding communities. Massport has in place an extensive Ground Access Management Plan (GAMP) to increase the overall efficiency of the metropolitan transportation system through interagency coordination; increase the annual air passenger HOV mode; reduce employee reliance on commuting alone by private automobile; provide adequate long-term parking within the limits of the Logan Airport Parking Freeze; and improve management of ground access and infrastructure through technology. The AITC project and the creation of a fourth Logan Express site are part of Massport's comprehensive GAMP. The goal of the Airport Intermodal Transit Connector is to reduce Logan Airport vehicular traffic by providing a direct link between Logan Airport and South Station with connections to the Red Line and the Commuter Rail (Purple) Line. Similarly, Massport operated bus service from designated Logan Express sites is intended to reduce Logan–generated traffic on area roadways. The Rhode Island Department of Transportation, along with the City of Warwick and the RI Economic Development Council have proposed construction of the Warwick/T.F. Green Intermodal Station, an Amtrak/Commuter Rail Station on the Northeast Corridor with a people mover connection to T.F. Green/Providence Airport. The Commonwealth of Massachusetts and the governor have supported this initiative by joining with the governor of Rhode Island in a formal agreement allowing the MBTA to extend Commuter Rail service from Boston's South Station and the Route 128 train station to the Warwick/T.F. Green Intermodal Station when it is completed. Other projects, such as bus service from the Logan Express sites to the regional airports may also encourage greater use of the regional airports. These ground transportation projects have merit independent of the Airside Project.

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17.73	Regional	Alternatives	Massport omits the tangible economic benefits of a decentralized regional airline transportation service. Distributional justice is a principle related to the concept of environmental justice; the distribution of economic benefits related to a decision of regional consequence should accrue as equitably as possible across the entire region and not only to a small, favored section of that region. It is shortsighted and myopic for Massport to count as economic benefits only what we believe to be the inflated economic benefits of delay reduction. In promoting the Preferred Alternative over investment in improving regional transportation services, Massport promotes an economic development policy that hinders the development of the state economy as a whole.	The entire regional air transportation system, including Logan Airport, requires investment. FAA is not promoting the Preferred Alternative over investments to improve regional airports. The FAA has long recognized that increased use of regional airports is a critical component of a long-term strategy for accommodating anticipated growth in the region's air passenger demand. In fact, the FAA has provided AIP funds since the early 1990s to initiate development of these regional airports. (See Table 2.9-1, Investments in the Region's Airports, in the Supplemental DEIS/FEIR). Over $200,000 has been spent on capital improvements for the regional airports. These regional airport investments have produced benefits to areas outside of the Metropolitan Boston area by attracting airlines and passengers to regional airports that were previously underutilized. Several regional transportation planning studies that have been conducted since 1989 have concluded that a sound inter-city transportation plan for the region involves not only expansion of the regional airports and the development of high-speed rail, but also the construction of Runway 14/32 and other infrastructure improvements at Logan Airport. Improving the efficiency of Logan Airport is a critical component of a successful regional transportation plan because it benefits the largest segment of New England's air passenger market. The immediate area served by Logan Airport, Boston and its surrounding suburbs, is the single largest generator of resident air trips in New England. The greater Boston metropolitan area is also the most popular New England destination for visiting business and leisure air passengers. Reducing delays at Logan Airport produces immediate benefits to the greatest number of New England air passengers. While initiatives to improve the efficiency of the region's inter-city transportation network can reduce the region's heavy reliance on Logan Airport, they are not an alternative to the proposed Preferred Alternative. Regional transportation alternatives do nothing to address a significant source of Logan Airport's airside delays in northwest wind conditions. The Preferred Alternative provides clear benefits at recent and future traffic levels by reducing preventable delays that occur during northwest wind conditions. Northwest wind delays at Logan Airport, which inconvenience and create unnecessary costs for hundreds of thousands of air passengers each year, cannot be mitigated solely through regional alternatives. There have been no airside improvements at Logan Airport for over two decades. To further the role of regional airports, the FAA, Massport, the Massachusetts Aeronautics Commission, the other 5 New England states, the Manchester Regional Airport, and the Rhode Island Airport Corporation are conducting the New England Regional Aviation System Plan, a continuation of the 1995 New England Regional Airports Air Service Study. The study will forecast long-term passenger and cargo demand for the entire region, identify operational capacity and environmental constraints to growth, and formulate strategies for maximizing regional airport use and creating a balanced and efficient regional airport network.
17.74	Alternatives	Navigational Equipment	Implementation of advanced navigational technology will assist in reducing environmental impacts by permitting aircraft to come in over water, and by reducing the flying distance to the airport when Runway 33L is in use, as well as allow airspace planners to extract more capacity out of Logan without building a new runway.	Widespread implementation of advanced navigation systems such as G.P.S. and F.M.S., along with advanced communication and display equipment, will enable aircraft to fly routes with fewer environmental impacts, and to do so more precisely. By producing more precise spacing of aircraft, so-called 4D systems may eventually provide small incremental reductions in delay. However, improved navigation systems cannot relieve Logan's fundamental limitation of runway capacity, particularly during northwest operations. Most new technologies under development will improve safety (e.g. reduce runway incursions), or reduce delays in the enroute sector. Even those technologies that may reduce runway delays (e.g., reduced wake vortex separations for parallel approaches), would not address Logan's loss of normal operating

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				capacity under northwest wind conditions. There are no new technologies under development which would substitute for the delay reduction benefits of Runway 14/32.
17.75	Runway 14/32	Injunction	Massport has stipulated and agreed to a court order not to build any more runways at Logan, yet Massport now seeks to breach this Agreement and proceed with runway construction;	FAA and Massport acknowledge the existence of an agreed injunction prohibiting the construction of a Runway 14/32 concept and the use of other airfield improvements proposed in the early 1970s. The express terms of this injunction, however, allow future improvements under certain circumstances, (e.g., changed conditions) or, more generally, if application of the terms of the injunction on a prospective basis is no longer equitable. The issue of the applicability and/or continued validity of the 1976 injunction to the Runway 14/32 component of the Airside Project is now before the Massachusetts Superior Court.
17.76	Noise	Flight Tracks	On March 14, 1980 the Federal Aviation Administration (FAA) issued a Record of Decision (ROD) pertaining to Runway 22R departures at Logan. This decision mandates that turbojet aircraft departing Runway 22R fly a 100-degree compass heading until 5DME from the BOSTON VORTAC. This procedure was selected from six options that weighed operational feasibility and safety, noise impact, economic effects, energy consumption, air quality effects and induced socio-economic effects. However, the Standard Instrument Departure shows that this agreement is being violated and that pilots are instructed, when departing Runway 22R, to turn left heading 140 degrees, minimizing the benefits of the 1980 ROD; and…	This comment refers to the operations of Logan Airport in general and not specifically the Airside Project.
17.77	PRAS	Implementation	Although Massport agreed to adopt PRAS, PRAS goals have not been achieved, and historically have not been implemented by controllers.	The degree of attainment of the PRAS goals depends on two factors: how well the PRAS recommendations meet the goals, and how well the controllers are able to follow the PRAS recommendations. The limitations on the former are weather, demand and Logan Airport's runway layout. Construction of Runway 14/32 will provide another high-capacity configuration that will enable PRAS recommendations to approach the goals much more closely than without the Runway, despite continually growing demand. Since the "safe and expeditious flow of traffic" is the FAA's first priority, PRAS recommendations may occasionally be modified or disregarded. Inaccurate weather or demand forecasts, equipment outages, staffing or workload issues may prevent the FAA from accepting the PRAS recommendation. The PRAS monitoring and reporting mitigation measure, which is discussed in Section 8.5.4 of the Supplemental DEIS/FEIR and Chapter 4 of this Final EIS, will assist in this regard, as will the additional flexibility of Runway 14/32. Overall, however, the Supplemental DEIS/FEIR demonstrates that the controllers have been improving conformance with respect to PRAS goals.
17.78	Alternatives	Part 161	Cap the growth of Logan.	The FAA is committed to enhancing safety and increasing the efficiency of air travel by modernizing the air traffic control system and expanding the capacity of the national air transportation system. Logan is a critical part of the national system, and the FAA's goal is to satisfy the demand for air transportation at Logan as safely and efficiently as possible without artificially constraining demand. Any artificial constraint or cap on airport activity would likely conflict with federal constitutional provisions, federal aviation statutes and regulations, and contractual provisions related to Federal Airport Improvement Program grants. In addition, no airport proprietor is permitted to implement a mandatory access restriction such as a cap without following the procedures of FAR Part 161. The FAA's Part 161 process is a difficult process for airports to undertake because of the demanding legal

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				requirements that must be satisfied to obtain approval for mandatory access restrictions. To date, no large air carrier airport has been able to obtain an approval for a Part 161 mandatory access restriction.
17.79	Alternatives	Part 161	Limit Logan to provide only long-haul and international services, requiring all other passengers to use other regional airports and alternative modes of transportation.	Refer to response to Comment 17.80. Existing laws prevent airport proprietors from controlling airline prices, routes, and schedules. Congress has specifically forbidden airport operators from exercising any discriminatory action against any class of airport users. Since the Airline Deregulation Act of 1978, air service decisions are made by the airlines and not by government. Limiting operations at close-in downtown airports is exactly counter to the benefits of airline service for high-speed inter-city transportation. The greatest benefit of an airport that is close to the business and population center of a city is its convenience to passengers making short-haul trips. In cities with multiple airports, the close-in airport is maintained for short-haul travel and the more distant airport functions as the long-haul and international airport. One example is in the Washington Metro Area, where Washington Reagan National is limited by a federally enacted perimeter rule to aircraft flights with nonstop distances of 1,250 miles or less. Washington Dulles International, the more distant airport, functions primarily as the long-haul and international airport but also offers short-haul services. Similarly in the New York City area, LaGuardia Airport is limited to flights with nonstop distances of 1,500 miles or less, while the more distant airports, Newark and J.F. Kennedy International, accommodate long-haul and transoceanic flights.
17.80	Regional	Regional Airports	Develop and implement a plan to direct passengers within Route 128 and Route 495 away from Logan and to other regional airports.	Existing laws prevent airport proprietors from controlling airline prices, routes, and schedules. Refer to responses to Comments 17.79. Developments at the regional airports and their impacts on Logan Airport are described in Sections 2.3 to 2.6 of the Supplemental DEIS/FEIR and Section 3.1 of the Final EIS. Logan Airport is part of a regional system of airports that includes T.F. Green/Providence, Manchester, and Worcester Regional airports. FAA has long recognized that service development and increased passenger traffic at these airports are an important part of the region's long-term strategy to accommodate passenger and activity growth. FAA has actively encouraged the development of these regional airports. Greater use of the regional airports will provide passengers within the service area of such airports with a viable alternative to Logan Airport. Since demand within Logan Airport's primary service area will remain strong, the improvements at other regional airports will not eliminate the need for Logan to safely and efficiently accommodate its core market area demand. Over the last ten years, various agencies and transportation planning organizations have conducted a number of studies that address regional transportation issues. These studies form the basis of a comprehensive regional transportation strategy that includes the Airside Project at Logan Airport, expansion and growth of the regional airports, and the implementation of high-speed rail and other regional rail projects. All these measures are necessary for meeting the short-term and long-term inter-city travel needs of the New England region. These regional recommendations are in various stages of implementation. By the end of 2000, Boston residents had several alternatives to Logan Airport including Worcester Regional Airport, Manchester Airport, T.F. Green/Providence Airport, Pease International Tradeport, and Amtrak's high-speed Acela train service. Refer to Chapter 2 of the Supplemental DEIS/FEIR for a complete discussion of options to Logan Airport.

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17.81	Alternatives	No Growth Alternative	Limit landside growth at Logan. Restrict the construction of additional gates, implement parking restrictions and perform a comprehensive short- term and long-term cumulative delay study on access to terminals; access to gates within terminals; as well as other airside delays.	The purpose of the Airside Improvements Planning Project is to reduce current and projected levels of airfield congestion and delay and to enhance the safety of aircraft operations at Logan. Massport's proposed landside improvements are planned to enhance the efficiency of passenger processing, and include terminal modernization, as well as roadway, parking and service area improvements. The landside projects will not affect the design or implementation of the Airside Project, which has independent utility, nor will the Airside Project improvements affect the design or implementation of any of the landside projects. All Massport projects, where required, will continue to be the subject of comprehensive environmental analysis by project proponents in accordance with federal and state regulations. The other past, present, and anticipated future projects proposed by Massport and others in the vicinity of Logan Airport have been evaluated to determine whether there are any cumulative environmental impacts. Refer to Section 2.3 of this Final EIS and Section 7.4 of the Supplemental DEIS/FEIR.
17.82	Alternatives	Part 161	Ban all nighttime flights from 11:00 p.m. to 6:00 a.m.	A ban on nighttime activity would require compliance with FAR Part 161. Compliance with the FAR Part 161 process has proven difficult for airports because of the demanding legal requirements that must be satisfied for approval of mandatory access restrictions. The Part 161 process also requires that all reasonable alternatives to mandatory access restrictions be implemented first. To date, no airport has been able to obtain approval for Part 161 mandatory access restrictions.
17.83	Alternatives	Part 161	Move all dedicated freight operations to another airport.	Since the majority of all-cargo operations occur during off-peak hours, i.e., periods of low-demand, they do not contribute to airside delays at Logan Airport. Existing laws prevent airport proprietors from controlling airline prices, routes, and schedules. Congress has specifically forbidden airport operators from exercising any discriminatory action against any class of airport users including all-cargo operators.
17.84	Regional	Regional Airports	Massport, in response to the Secretary's request to discuss the status of MEPA review for the proposed expansion of New Bedford Airport, made a statement in a footnote that simply says that the MEPA/NEPA process was underway and a DEIS/DEIR is due out at the end of 2001.	Comment noted. There is an ongoing New Bedford Airport EIS to study expansion alternatives. The New Bedford EIS has not yet selected a Preferred Alternative that involves cargo capability, so it is not reasonably foreseeable that any all-cargo operations could shift from Logan to New Bedford. As of August 2001 a Draft EIS/EIR for the New Bedford Airport expansion project has not been filed with EOEA.
17.85	Mitigation	Sound Insulation	The Secretary was concerned that the residences most in need of soundproofing will be in low income areas with relatively high proportions of sub-standard housing. The Final EIR should explain how often such circumstances have occurred in the past. If some (presumably low income) residents are likely to be denied noise mitigation on this grounds, the FEIR and the Proposed Section 61 Findings should consider financial or other programs to ensure equal access to noise mitigation. ...Massport failed to set forth in detail the amount of grant funds that will be made available to bring buildings up to code to precede with sound insulation work…	The homes in greatest need of sound insulation are not in low income areas as defined by federal government criteria. Without actually inspecting the homes eligible for sound insulation it is difficult at this time to estimate the amount of funds that would be needed for building code upgrades. Nevertheless, in its Section 61 Findings Massport has committed to fund building code upgrades that may be necessary to retain sound insulation eligibility if federal funds are not made available. As stated in the Section 61 Findings, pursuant to the Massachusetts Environmental Policy Act, "Relevant FAA general sound insulation program funding requirements do not provide sound insulation benefits for buildings that do not meet applicable building codes. However, in order to ensure that all residents of buildings who would otherwise be eligible for sound insulation do not lose eligibility because of building code considerations, funds will be provided, through special Project mitigation commitments from the FAA, to allow for building code upgrades to be made on individual homes to the extent that building code upgrades are necessary to allow the sound insulation work to be completed. To further ensure that all eligible residences are included within the sound insulation program, the specific identity of residences will be determined based upon a detailed block-by-block analysis to be performed during implementation. If federal funding is not available to complete the sound insulation of homes newly included within the 65 dB DNL as a result of the implementation of the Airside Project, the Authority commits to providing the funding necessary to

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				complete the sound insulation of those homes."
17.86	Cumulative	Runway 27 EIS	In response to the Secretary's request, Massport fails to discuss the relationship between the Airside Program and the Runway 27 EIS, failing to describe cumulative impacts.	The Runway 27 EIS and ROD are not related to the Airside Project. The Runway 27 EIS documents that the departure procedure adopted in 1996 reduces significant noise levels to approximately 6,500 people. Section 5.2.3.2 and Section 6.3.2.2 of the Supplemental DEIS/FEIR address differences in flight tracks between the Supplemental DEIS/FEIR, the Runway 27 EIS, and the Logan Airport 1997 and 1998 Annual Updates.
17.87	Noise	Nighttime	...Massport utterly fails to analyze or consider either a base case for the noise levels and contours resulting from nighttime flights over the water during the hours of 12 PM and 6 AM or an analysis for the effect and noise levels and contours of extending such hours to 10 PM to 7 AM. In fact, there is no direct discussion of nighttime noise levels on contours in Section 4.3.6 whatsoever.	The analysis presented in Section 4.3.6 of the Supplemental DEIS/FEIR evaluated the feasibility of extending the preferential nighttime (nocturnal) period to the hours of 10PM to 7AM. An examination using the DELAYSIM model indicated that beginning the nocturnal period before 11:00 PM or extending it past 6:15 AM would result in excessive delays. The FAA already switches to the nocturnal configuration as soon after 11PM as demand permits, and this is reflected in the DELAYSIM modeling. As a result, the existing noise analysis reflected the feasible extension of the nighttime period and precluded the need for additional noise analysis. It should also be noted that controllers can only employ the Runway 33L/15R nighttime configuration under favorable wind and weather conditions, which limits its use to about 60 percent of the time. In addition, the extended period would only be useable if there were no delays remaining from the previous hours. Finally, due to improved performance of Stage 3 jets, most noise benefits of nocturnal configurations can be obtained by using Runway 33L for overwater arrivals, whether or not 15R can be used for departures based on the demand level.
17.88	Runway 14/32	Unidirectional Commitment	The potential short-term, long-term and cumulative impacts of Runway 14/32 including the potential to make it bi-directional should be addressed in the Supplemental DEIS/FEIR.	Runway 14/32 is proposed as a unidirectional runway to avoid environmental impacts otherwise associated with a bi-directional runway, and with the objective of moving more aircraft operations over Boston Harbor and away from populated areas. Therefore, FAA did not analyze the environmental impacts of a bi-directional runway. Since bi-directional use is not proposed, there are no short-term, long-term, or cumulative impacts.
17.89	Mitigation	Construction	Massport directs the reader to Section 6.9 of the Supplemental DEIS/FEIR in response to Secretary's request for a quantitative analysis of the number of daily and total truck trips. However, this section only identifies projected trips for the airside improvements regarding the preferred alternative, and not the average cumulative daily truck trips all concurrent airport projects.	Average cumulative daily truck trips for all concurrent airport projects are reported in Section 7.5.1.1 Cumulative Impacts of the Supplemental DEIS/FEIR. Refer to Table 7.5-1, Average Cumulative Daily Truck Roundtrips Per Quarter.

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17.90	Mitigation	Construction	...Although Massport has proposed management coordination with other projects and has incorporated some mitigation measures in proposed contracts and subcontracts, in response to the Secretary's request, it has not addressed the cumulative impacts of those construction activities for the airside projects occurring simultaneously with Central Artery/Tunnel construction in East Boston, other projects at Logan Airport, and any other major construction activities planned to occur in East Boston. Massport has not adequately demonstrated how construction schedules could be changed to reduce the cumulative effects of preexisting projects nor has Massport delineated the role which community organizations would play in the preparation and enforcement of such mitigation measures.	The Airside EIS/EIR did address the cumulative construction impacts of the Airside improvement projects, other projects at Logan Airport, the Central Artery/Tunnel project, and MBTA projects in East Boston. The cumulative construction period impacts of these projects are not anticipated to be significant since all construction projects are subject to mitigation programs to reduce construction period impacts. As detailed in Section 6.9 of the Supplemental DEIS/FEIR, Massport has developed a number of mandatory construction mitigation procedures for all contractors to minimize community impacts, including a requirement that all construction vehicles access the site only via the main airport roadways and the Ted Williams Tunnel. These mitigation requirements will be reflected in FAA's ROD. Refer to Section 4.1.7 of this Final EIS. In addition, other large construction projects in East Boston (notably CA/T Contract 8A1) will be nearing completion as the Airside project construction is proposed to begin. Refer to Section 2.3.5 in the Final EIS and Section 7.5 in the Supplemental DEIS/FEIR for additional information on short-term cumulative construction impacts.
17.91	Noise	Nighttime	Massport fails to disclose the full impacts of nighttime construction noise by underestimating the severe impacts of an estimated nighttime noise increase of up to 3.9 dB over ambient noise levels and by failing to disclose the data it used to calculate said impact.	The potential noise impacts associated with the Airside Project construction activities were evaluated on a quarterly basis over the proposed five-year construction period. Noise impacts were assessed in terms of average daytime equivalent sound level, average nighttime equivalent sound levels and day-night equivalent level, using criteria based on the existing noise environment as well as applicable standards. The analysis evaluated the potential noise impact from the Airside project on the closest noise-sensitive areas to the construction zone compared to ambient noise levels and followed the methodology previously used for the West Garage and International Gateway environmental analysis. The construction noise analysis is described in detail in Section 6.9.4 of the Supplemental DEIS/FEIR. Assumptions on construction equipment use by quarter were the basis for the calculation of construction noise and are presented in Appendix J of the Supplemental DEIS/FEIR. Established Federal Highway Administration (FHWA) criteria were used to classify the impact associated with construction noise. The nighttime noise increases projected as a result of the construction of the Airside Project range from 0.5 dB to 3.9 dB over ambient noise levels during the construction period. (See Table 6.9-9 of the Supplemental DEIS/FEIR.) According to the FHWA criteria, a noise increase less than 5 dB would be considered “no impact”.
17.92	Natural Resources	Soil	Massport fails to respond to Secretary's request to address the Department of Environmental Protection's issues regarding excavate classification and management. Massport uses classifications and terminology which frustrates disclosure requirements and obfuscates factual inaccuracies.	Massport conducted a soil pre-characterization program in areas where excavation would be required for construction of elements of the Preferred Alternative. The soil pre-characterization program involved the installation of 93 soil borings within or in proximity to airside areas proposed for construction of the runway and taxiway improvements. Soil samples were analyzed at a DEP-certified laboratory. Certain areas within the footprint of the proposed taxiway improvements were found to exceed DEP’s Reportable Concentrations for various chemical constituencies. The soil in the footprint of the proposed unidirectional Runway 14/32 does not exceed DEP’s Reportable Concentrations for S-2 soil. Disposal of soils excavated for runway and taxiway construction will be regulated under the Massachusetts Contingency Plan (310. CMR. 40.0000) and further reviewed for consistency with Massport's Soil Management Plan developed for the Logan Modernization projects. The use and risk characterization terminology used is consistent with the standard terminology of the MCP. Refer to Sections 5.7 and 6.7 of the Supplemental DEIS/FEIR for additional information.

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17.93	Cumulative	Parklands/Historical Resources	Massport has failed to apply the appropriate noise metric to determine noise impacts on park lands, historic sites and recreational facilities.	The analysis of potential indirect noise impacts associated with the Preferred Alternative was performed by comparing the 65 dB DNL contour for the No Action Alternative and the Preferred Alternative for the 29M Low Fleet scenario. The 29M Low Fleet scenario has the greatest noise impacts of all the future scenarios analyzed. As depicted in Figure 6.3-4 of the Supplemental DEIS/FEIR, the Arnold Arboretum, Emerald Necklace and Franklin Park are well outside the 65 DNL noise contours associated with the Preferred Alternative.
17.94	Natural Resources	Upland Sandpiper	In response to the Secretary's request that the Final EIR should address off-site mitigation details for rare species, Massport fails to provide adequate detail for off-site mitigation and fails to provide in its Section 61 Findings any specifics as requested by the Massachusetts Military Reservation for habitat restoration.	The Upland Sandpiper is a species protected by Massachusetts law that is not considered a threatened or endangered species under federal law. Nevertheless, FAA notes that the concept mitigation plan presented in the Airside Project Draft EIS/EIR and Supplemental DEIS/FEIR has evolved through discussions between Massport, the Massachusetts Natural Heritage and Endangered Species Program (MNHESP) and the Massachusetts Air National Guard. MNHESP has issued a draft Conservation and Management Permit incorporating permit conditions. Copies of the MOU and the draft permit are contained in Appendix E of the Supplemental DEIS/FEIR. This mitigation commitment by Massport is reflected in its Section 61 findings. See Section 4.1 and Appendix B in this Final EIS.
17.95	Public Participation	Public Notice	Massport failed to file the Supplemental DEIS/FEIR with the Hull Public Library.	The Supplemental DEIS/FEIR was shipped to the Hull Public Library on March 21, 2001 and received and signed for by the library on March 22, 2001 at 11:33 AM, well within the filing guidelines. In addition, the document was sent to 34 other libraries within the Boston vicinity, as listed in the Reviewers List in Volume 2.
17.96	Regional Jets	Fleet Mix	Section 4.2.2.2, of the Supplement DEIS and Final EIR, and the Review of Forecast Regional Jet Utilization - Proposed Runway 32 at Logan International Airport, attached in Appendix C of Supplement DEIS and Final EIR fail to present an accurate forecast mix of the regional jet aircraft types at Logan for any benchmark.	Neither referenced section discussed the updated forecast of RJ activity. The Review of Forecast Regional Jet Utilization - Proposed Runway 32 at Logan International Airport, in Appendix C of Supplemental DEIS/FEIR, described the independent assessment performed by the FAA to determine the runway utilization assumptions to be used in the Supplemental DEIS/FEIR analyses. Section 4.2.2.2 described the recent trend in regional jet growth that drove the development of an updated forecast. The new fleet reflecting the growth in RJs, the 37.5M High RJ fleet, was described in Section 4.2.4.2 of the Supplemental DEIS/FEIR. In addition, the analysis of an additional near-term RJ fleet, the 29M RJ Fleet, is described in Section 3.4 of this Final EIS. A breakdown of all of the fleet forecasts by aircraft type is included in Appendix D of this Final EIS.
17.97	Regional Transportation	Regional Study	...Other than Table 2.9-3...of the Supplemental DEIS/FEIR, and the Nine (9) page copy of a slide presentation...in Appendix B...Massport did not present any meaningful discussion of the proposed New England Regional Aviation System Study or the proposed work scope, as requested by the Secretary.	The organization of the New England Regional Aviation System Plan Update and a proposed scope of work were in the preliminary stages of development when the Supplemental DEIS/FEIR was filed in March 2001. Since then, a consultant team was selected in May 2001 and discussions regarding a formal scope of work began in June 2001. The consultant team and the Project Management Team, which consists of FAA, Massachusetts Aeronautics Commission (MAC), Massport, the other five New England States, Manchester International Airport, and the Rhode Island Airport Corporation (RIAC), continued to work on finalizing a formal scope of work in July and August 2001. An FAA grant was issued on August 28, 2001 to both Massport and Massachusetts Aeronautics Commission to fund the study. Refer to Appendix C of this Final EIS for the System Plan Update Scope of Work.

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17.98	Peak Period Pricing	Profile	In response to the Secretary's request to expand on the peak period pricing analysis, Massport did not draw any focused comparisons between changes in airline scheduling over time to assess the flattening of the demand profile. Also, Massport did not represent any cogent assessment as to whether the flattened profile or a more peaked profile is likely to occur in the new future fleet (2015 Modified 37.5M RJ fleet). Massport failed to explain any of the operational analysis or the methodology utilized to determine the long-term planning forecast under the 2015 Modified 37.5M RJ Fleet Scenario.	Section 4.2 of the Supplemental DEIS/FEIR describes the recent trends leading to the development of the 37.5M High RJ scenario, as well as the assumptions underlying the fleet scenario. The flattening of the demand profile was described in Section 4.2.2.3, while Section 4.2.2.4 explained why the less-peaked demand is expected to continue.
17.99	Peak Period Pricing	Impacts	Massport failed to present any discussion or analysis of the uniqueness of Cape Air and the communities it serves. Despite Massport's insistence that such analysis in Chapter 4, there is no reference to such analysis, let alone, a reference to "Cape Air" in the index of the Supplemental DEIS/FEIR.	Sections 4.5 and 4.7.1 of the Supplemental DEIS/FEIR discuss peak period pricing, including potential exemptions for the Cape and Islands markets served by Cape Air, as well as consideration of exemptions for operational factors specific to Cape Air such as the use of 2,557 foot Runway 15L/33R. In addition, Section 4.4.7 and Appendices F and G of the Draft EIS/EIR present case studies showing the impact of Peak Period Pricing on Cape Air and the Cape and Island markets.
17.100	Peak Period Pricing	PACE	Massport failed to adequately analyze or discuss the successful implementation of congestion pricing in Massachusetts. Additionally, Massport failed to provide a thorough analysis of Peak Period Pricing and the demand management mechanisms considered at New York LaGuardia Airport, or additional case studies.	Demand management studies, including both LaGuardia and historic implementations in Massachusetts, were discussed in Section 3.5.1 of the Supplemental DEIS/FEIR.
17.101	Delay	Ranking	The Secretary requested that the SDEIS assess Logan's relative national delay ranking if Runway 14/32 was available in 1998, yet no such discussion was found. In complete disregard of the FAA's directive, without any explanation, Massport contrived delay statistics for Logan with a purported nationwide context utilizing the FAA Consolidated Operations and Delay Analysis System for the twelve month period ending November 2000.	The analysis presented in the Supplemental DEIS/FEIR in Section 1.4.2, Delays at Other Airports and Changes in Logan's Delay Ranking, responds to the FAA's scope to "Assess Logan's relative national delay ranking if Runway 14/32 was available in 1998". The analysis used the latest published delay data from the FAA's CODAS database to determine delays at U.S. airports and Logan Airport's ranking. Logan Airport's delay ranking with Runway 14/32 was determined from delay modeling which showed that Runway 14/32 would have reduced Logan Airport delays by 27 percent if Runway 14/32 was available in 1998.
17.102	Delay	National	The Secretary requested that the SDEIS discuss how delays at Logan affect the national air transportation system, yet no such discussion was found.	The analysis presented in the Supplemental DEIS/FEIR in Section 1.4.2, Delays at Other Airports and Changes in Logan's Delay Ranking, contains a discussion on how delays at Logan Airport affect the national air transportation system. Using the FAA's CODAS data, the analysis shows that Logan Airport ranks 5th in "Where Caused" delays, indicating that Logan Airport is one of the airports most likely to cause delays at other airports. Refer to Table 1.4-7, in the Supplemental DEIS/FEIR for CODAS Delays for Logan and Its Top Ten Large Hub Destinations, .

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17.103	Delay	National	In response to the Secretary's request that the SDEIS discuss measures FAA is pursuing to reduce delays nation-wide, Massport focused exclusively on airport structural programs, and failed to discuss or even mention Federal Aviation Administration programs, initiatives, and technologies, that have the practical effect on reducing delays and improving airside efficiency, like: Reduced Vertical Separation Requirements, Display Systems Requirements, Standard Terminal Automation Replacement Systems, Operational and Supportability Implementation Systems, Next Generation Air/Ground Communications ("NEXCOM"), Global Positioning Systems, and an Integrated Terminal Weather System.	The efforts listed here will have little or no impact on delays at Logan Airport. FAA continues looking at new procedures and technologies to increase the efficiency of a national aviation system. The items cited in the comment are used to reduce enroute delays or increase controller efficiency.
17.104	Public Participation	Response to Comments	As the Secretary requested, the Supplemental DEIS/FEIR failed to provide a substantive detailed response to each individual comment submitted by SDEIS Panel member, Mary Ellen Welch.	Refer to Appendix A of the Supplemental DEIS/FEIR for the written responses of the comments by Ms. Welch.
17.105	Cumulative Impacts	Segmentation	The Federal Aviation Administration and the Massachusetts Port Authority's Fragmentation of Airside and Landside Projects That Are Connected, Cumulative, and Similar Actions Into A Series of Separate Project Reviews Constitutes A Segmented Review Under the National Environmental Policy Act, 42 U.S.C. &&4321-4343 and the Massachusetts Environmental Policy Act M.G.L. Ch. 30 && 61-62H…Massport and the Federal Aviations Administration's Segmented Approach to the Inter-Related Airside and Landside Projects Prevents any Meaningful Broad Scale Analysis or Comprehensive Environmental Review.	In accordance with Council on Environmental Quality (CEQ) regulations and guidance and FAA implementing directives, Section 2.3 of the Final EIS and Section 7.3 of the Supplemental DEIS/FEIR analyzed the past, present, and reasonably foreseeable future actions in the vicinity of Logan Airport and determined that there were no cumulative impacts related to the Airside Project, other than temporary construction-related impacts. The purpose of the Airside Project is to reduce current and projected levels of airfield congestion and delay and to enhance the safety of aircraft operations at Logan. Massport's ongoing and proposed landside improvements to enhance the efficiency of passenger processing, include terminal modernization, as well as roadway, parking and service area improvements. The landside projects will not affect the design or implementation of the Airside Project, which has independent utility, nor will the Airside Project improvements affect the design or implementation of any of the landside projects. All airside and landside projects, where required, will continue to be the subject of comprehensive environmental analysis that examines cumulative environmental impacts. FAA also examines pertinent GEIR/ESPR documents which provide cumulative impact analysis of Logan operations, impacts and mitigation.
17.106	Alternatives	Project Change	Expansion of Project: The square footage and linear footage and acreage of the proposed runways have been increase [sic] by over 10%.	There has been no change in the square footage, linear footage, or acreage of the proposed Runway 14/32 since it was presented in the Draft EIS/EIR and Supplemental DEIS/FEIR.
17.107	Environmental Justice	Requirements	The Supplemental DEIS/FEIR do not meet the [environmental justice] requirements of the Executive Order and the DOT order, or the EOEA' own policy;	The Environmental Justice analysis is set forth in Section 6.8 of the Supplemental DEIS/FEIR and Section 3.6 of this Final EIS. These analyses meet all applicable requirements. Low-income and minority populations were defined in accordance with Federal Executive Order 12898, the Final US Department of Transportation Order, and the Council on Environmental Quality's analysis complies with Federal Executive Order 12898, the Final United States Department of Transportation Order on Environmental Justice, and the Council on Environmental Quality's guidance on Environmental Justice. In addition, the analysis of low-income populations was expanded to include households at 150 percent of the poverty level and the analysis of minority populations was updated in this Final EIS to reflect Year 2000 Census data on total population, race and ethnic origin at the block level, which was released by the U.S. Census Bureau on March 21, 2001. (The

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				Census Bureau will not begin to release comparable data on income on a state by state basis until June 2002 at the earliest.) The Secretary of Environmental Affairs Certificate on the FEIR for the Logan Airside Improvements Project (EOEA #10458) issued on June 15, 2001 states that the environmental justice analysis contained in the FEIR responds to the guidance in the DEIR certificate. It further states that the EOEA draft Environmental Justice Policy has not been finalized and therefore does not apply to the Airside Project undergoing MEPA review.
17.108	Runway 14/32	Cost-Benefit Analysis	Massport's discussion of economic benefits is misleading and unsubstantiated;	Section 1.5 of the Supplemental DEIS/FEIR presents a summary of the economic impact of Logan Airport on the local economy. The data is from Economic Impact Analysis of Logan Airport, FY 1998, prepared by Massport. The methodology used to calculate the economic benefits of Logan is based on the FAA's published guidelines for performing economic impact analyses for airports and has been reviewed and found accurate by FAA.
17.109	Noise	Actual vs. Modeled	…the 1999 Supplemental DEIS/ Final EIR prediction for 1999 is 3.5 dB less than the actual 1999 ESPR value for 1999 at the Hull monitor. Moreover, the 1999 ESPR are based on 29.5M operations while the 1999 Supplemental DEIS/Final EIR are based on 29M operations. This difference amounts to an additional error of over 0.2 dB.	The 29M Low Fleet scenario represents a future scenario rather than the actual 1999 conditions modeled in the 1999 ESPR or the 1998 conditions presented in the Supplemental DEIS/FEIR. Note that the forecast scenario includes 29M passengers, not 29M operations. The 29M Low scenario is based on different fleet, weather, and runway use assumptions. The forecast fleet has lower noise exposure than the historical fleets because it includes fewer Stage 2 aircraft, including fewer of these noisiest aircraft operating at night. The activity levels can be compared by looking at Table 6-1 in the 1999 ESPR and Table 6.2-1 in the Supplemental DEIS/FEIR. The former shows the number of Stage 2 aircraft operating at Logan Airport in 1998 and 1999; the daytime and nighttime operations were 84.93 and 5.92, and 83.30 and 6.66, respectively, for each of those two historical periods. Table 6.2-1 in the Supplemental DEIS/FEIR shows the number of Stage 2 aircraft assumed to be operating under the 29M Low fleet scenario. Those daytime and nighttime operations are 16 and 6, respectively. Other factors being equal, the fewer number of operations by these noisiest aircraft is expected to produce a reduction in exposure on the order of 3 decibels compared to recent historical levels.
17.110	Noise	Discrepancies	Figure 5.2-3 on page 5-21 of the Supplemental DEIS/Final EIR Massport presents the predicted 1999 Historic DNL contours. The DNL at the Hull monitor is approximately 55 dB. The companion report entitled "Current Noise Levels Generated at Hull by Logan Airport" (footnote: 69) shows that the actual measured airport only noise levels in 1993 were 63.7 dB. That is the 1993 Historical Supplemental DEIS/Final EIR prediction under-predicts the true, measured DNL at the Hull monitor by just under 9 dB. Note: an increase of 9 dB is equivalent to an eightfold increase in the number of aircraft operations.	The commenter compares measured and computed DNL exposure levels for 1993, from which he/she incorrectly concludes that the Supplemental DEIS/FEIR underpredicts the noise at Hull High School by approximately 9 decibels. There are two flaws with this comparison. First, Figure 5.2-3 of the Supplemental DEIS/FEIR shows DNL noise exposure contours for 1993 "Historic Modeled Conditions" as well as 1998 (not 1999) "Actual Conditions." The 1993 modeled scenario is based on simulation modeling using the DELAYSIM model, which predicts runway use based on demand levels, PRAS goals, and a 10-year history of weather conditions at Logan. These predictions of runway use do not necessarily match actual runway utilizations that are dictated by actual traffic and weather conditions that vary daily throughout the year. The 1993 case is a modeled scenario, not a historical scenario, and any comparison to 1993 measured levels will have an inherent difference due to the differences in runway use. A second flaw with the commenter's comparison is that Massport's noise monitoring system was not capable of determining the aircraft-only DNL in 1993. The measured level that year was 65.7 as reported in the Boston-Logan 1993 Annual Update, but this included aircraft and non-aircraft noise sources. It was not until late 1997 that the system was upgraded to allow the separation of aircraft from non-aircraft noise events. In 1998, the first full year for which aircraft-only DNL values existed, the exposure attributable to aircraft was only 59.2 dB compared to a total exposure level of 63.2 dB -- the noise from aircraft actually being less than the noise attributable to other sources. The same was true in 1999; aircraft noise at the Hull noise monitor remains about 4 dB below the total measured exposure.

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				Together, these two factors make the comparison between measured and modeled levels irrelevant for 1993.
17.111	Noise	Discrepancies	Compared with other sites, the Supplemental DEIS/Final EIR DNL predictions for the Hull monitor are biased low…The Carey Circle monitor site in Revere is similar to Hull…the 1999 predictions for the Supplemental DEIS/Final EIR and the 1999 ESPR are the same for Carey Circle but differ by 4 dB at Hull.	The 29M Low Fleet scenario represents a future scenario rather than the actual 1999 conditions modeled in the 1999 ESPR or the 1998 conditions presented in the Supplemental DEIS/FEIR. The 29M Low scenario is based on different fleet, weather, and runway use assumptions. A comparison between measured and modeled noise levels for a single analysis scenario does not support the conclusion that the Hull noise levels are biased low by 4 dB. The difference between measured and modeled levels reported in the Supplemental DEIS/FEIR for 1998 operations is 1.1 decibels; the difference in the 1999 ESPR for 1999 operations is 0.6 decibels.
17.112	Noise	Discrepancies	…Table 6.2-24 on page 6-74 gives the predicted DNL at the Hull monitor as 55.7 dB for the 37.5M High RJ Fleet whereas Figure 6.2-11 on page 6-59 gives this value as about 60 dB, a discrepancy of 4 to 5 dB…Table E.2 (footnote 71) of Volume 3 of the Supplemental DEIS/Final EIR gives the nighttime equivalent level at the Hull monitor as 58.3 dB. However this nighttime equivalent level using standard equations, calculates to a DNL that is at least 64 dB before adding the daytime noise. With daytime noise, the DNL at the Hull monitor according to this table for the 37.5M High RJ fleet is 65 dB, a discrepancy of almost 10 dB between Table E.1 or Table 6.2-24 and Table E.2…. Based on the nighttime equivalent level data of Table E.2 in Volume 3 and the 8 dB error in prediction inherent in the Supplemental DEIS/Final EIR at Hull, the true value for 37.5M High RJ fleet DNL prediction may be as large as 73 dB.	Table 6.2-24 and Figure 6.2-11 in the Supplemental DEIS/FEIR are not inconsistent; the noise monitor is located at the high school and is positioned outside the DNL 60 contour. However, there are several typographical errors in Table E.2 of Volume 3. The correct value for the nighttime Leq at Hull High School (site 26) is 48.5 dB, the value erroneously attributed to site 25, not 58.3 as reported. The DNL value of 55.7 dB appearing in Table E.1 and Table 6.2-24 is correct.
17.113	Noise	Discrepancies	The INM computer simulations are inherently biased low. This inherent bias adds biases the levels at Hull low by an additional 3 dB…The companion report, "Current Airport Noise Levels at Hull," show that true measured DNL levels are about 3dB greater than accurately and correctly constructed DNL predictions.	The accuracy of the aircraft-only DNL calculations are related to the distance from the airport where aircraft noise levels are lower than at closer-in sites or are low compared to non-aircraft noise sources at the site. This is true of any noise monitoring system that attempts to isolate aircraft from other noise. However, the essential noise analyses upon which the Airside alternatives are evaluated utilize the modeled levels from the INM rather than the measured levels from the monitoring system. That is the only means by which future alternatives can be examined and that is the primary means of judging the impacts of the alternatives examined in this Final EIS and its accompanying documents.

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17.114	Runway 14/32	Nighttime Operations	The number of nighttime operations by Hull are biased low. Currently, in 1999 by Hull, 27.5 percent of landings on 33L are at night. Under the 37.5M High RJ fleet, this percentage drops almost in half to just 15.5 percent. The assumed percentage of nighttime operations on Proposed Runway 32 is only 8.8 percent; and this prediction is for a much more crowded and delayed airport. (Runways 32 and 33L are the "preferred" runways for nighttime landings). In contrast at Carey Circle, an area that is "not preferred" for nighttime operations, the percentage of nighttime landings goes from a current (i.e. 1999) percentage of 31.3 to 45.5 percent under the 37.5M High RJ fleet alternative. These types of faulty assumptions bias the data low by Hull.	A comparison between the percentage of an individual runway's operations occurring during nighttime hours under recent and future conditions is not relevant. Using the 33L arrival example, in 1999, there were 31,300 jet arrivals on 33L and 8,600 nighttime jet arrivals (Refer to Appendix C of the Supplemental DEIS/FEIR). With the 37.5M High RJ Fleet and the Preferred Alternative, nighttime jet arrivals on 33L increase to 11,500 (with an additional 2,300 on 32) while total jet arrivals on 33L increase to 75,300 (with an additional 26,200 on 32). While the percentage of 33L arrivals occurring at night declines relative to recent conditions, the number of nighttime arrivals increases and the number of total overwater arrivals increases by over 60 percent. The correct comparison is between the No Action and Preferred Alternatives, comparing the percentage of total and/or nighttime operations on a given runway. According to the 1999 ESPR, the percentage of nighttime arrivals passing over or near Hull to land on Runway 33L in 1999 was 35.2 percent, a higher nighttime utilization than for any other runway. With the 37.5M High RJ Fleet and the No Action Alternative, use of 33L for nighttime arrivals drops to 15.2 percent because the existing configuration cannot handle the higher demand levels forecast for the future, even though Runway 33L remains the most preferable for noise mitigation. Instead, Runway 4R becomes the most heavily used runway for nighttime arrivals. However, if new unidirectional Runway 14/32 is constructed, Runway 32 can be used for nighttime landings approximately 8.9 percent of the time and Runway 33L can be used an additional 27.6 percent of the time, together handling 36.5 percent of the nighttime arrivals with 33L again becoming the most heavily used of any runway for nighttime arrivals. This is completely consistent with preferring to have operations remain over water during nighttime hours. Carey Circle to the north of Logan Airport in Revere is affected by nighttime landings on Runway 22L. In 1999, 20.0 percent of the night operations landed on that runway. With the 37.5M High RJ Fleet and existing runway configuration, use of that runway for arrivals at night increases to 28.0 percent. However, if the new unidirectional Runway 14/32 is constructed, more nighttime arrivals will come into the airport over the water and the nighttime use of Runway 22L is projected to drop to 22.4 percent. Again, this is consistent with the desire to keep more traffic over water whenever feasible. The overflights numbers referred to in the comment and this response are from the Supplemental DEIS/FEIR analysis and assume the unrestricted use of Runway 14/32. The FAA's proposed 10-knot northwest/southeast wind restriction would reduce the use of Runway 14/32. See Section 3.8, Section 4.1.2, and Appendix D of this Final EIS for more information on the proposed northwest/southeast wind restriction mitigation measure.
17.115	Mitigation	Sound Insulation	Massport should redo its contours to ensure that all eligible dwellings are sound-proofed. Massport committed to soundproofing for those who reside in the 65dB level, therefore Massport must reanalyze the data regarding Hull using actual data so that it can insure to include the 1500-200 homes in Hull (including Hull High School) and Hingham that are expected to be affected by the increased noise.	Sound insulation eligibility is determined from the INM and not noise monitoring measurements. The Supplemental DEIS/FEIR and the Final EIS indicate that Hull will not fall within the 65 dB DNL, or even the 60 dB DNL, under any future scenarios analyzed. If any portion of Hull were ever to fall within the 65 dB DNL contour, that area would qualify for sound insulation through Massport's on-going sound insulation program.

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17.116	Noise	Contours	The 37.5M High RJ Fleet Scenario does not reflect reality by Somerville. Table 3 in C.6 of the Supplemental DEIS/FEIR gives the total annual jet operations excluding RJ's by runway end. Takeoff operations on Runway 33L increase from about 8000 in 1999 (Table 2) to almost 20,000 (Table 3), an increase of 250 percent. Table 4 gives the equivalent jet operations by runway end. In Table 4, takeoffs on Runway 33L increase from 17,200 to 68,200 in the 37.5M High RJ fleet scenario-- an increase of almost 400 percent. But by Somerville and Everett, the contours under the 37.5M High RJ fleet scenario (Alternative 1A) grow smaller compared with the contours for the 29M Alternative 4 fleet scenario. This simply cannot be. With reasonable and proper assumptions, the contours do not get smaller with a fourfold increase in effective operations.	In assessing noise impacts, the proper comparison is the change in equivalent jet operations between the No Action and Preferred Alternatives. According to Table 4 of Appendix C of the Supplemental DEIS/FEIR, equivalent jet departures from Runway 33L over Somerville increase from 19,700 to 68,200 with the Preferred Alterantive (and an unrestricted Runway 14/32) under the 37.5M High RJ Fleet. While this change in runway use is consistent with greater achievement of the PRAS goals and usage of 33L for departures would still remain below the long-term PRAS goal (i.e., 10.5 percent versus the goal of 11.9 percent), the CAC has withdrawn its support for the current PRAS program. With support from FAA, Massport has committed in its Section 61 Findings, pursuant to the Massachusetts Environmental Policy Act, to work with the Community Advisory Committee (CAC) to reassess the PRAS program. In order to prevent a major change in Logan's runway utilization pending this reassessment of PRAS, the FAA in this Final EIS is proposing to restrict Runway 14/32 for use only during northwest or southeast winds of 10 knots or greater. In proposing this restriction, the FAA expects that the principal delay reduction benefits of the runway would be realized and that runway utilization at Logan Airport would remain consistent with recent patterns. See Section 3.8 of the Final EIS for a discussion of the wind restriction analysis and Section 4.1.2 for operational implementation of the restriction. As for the DNL contours shrinking with the increase in operations, this is reasonable since the fleet gets quieter in the future. Compared to the 29M Low scenario, the long-term 2015 37.5M High RJ scenario has significantly fewer operations by louder Stage 2 and hushkitted aircraft. This difference is magnified because many of these louder operations in the 29M Low fleet occur during nighttime hours when noise impacts are more heavily weighted.
17.117	Health	Noise Pollution	The Supplemental DEIS/FEIR fails to evaluate known impacts by Somerville that will lead to increased complaints. The Supplemental DEIS/FEIR does not consider sleep disruption as an impact. But many of the Somerville residents have complained that noise early in the morning wakes them frequently at times like 6 AM. But under the 37.5 M High RJ fleet scenario, early morning takeoffs on Runway 33, will increase. There will be an increase in sleep disruption and, as the companion study shows, likely a three to fourfold increase in complaints.	The Airside EIS Documents indicate that the Day-Night Sound Level values in Somerville are less than 60 dB for all future scenarios analyzed. However, the predicted increase in flights using Runway 33L and Runway 27 for departure that would occur with the construction of Runway 14/32 has generated numerous public comments. While the increased departures to the northwest and west are consistent with the goals of Logan's Preferential Runway Advisory System (PRAS), community representatives have withdrawn their support for the existing PRAS system. With support from FAA, Massport has committed in its Section 61 Findings to work with the Community Advisory Committee (CAC) to reassess the PRAS program. In order to prevent a major change in Logan's runway utilization pending this reassessment of PRAS, the FAA in this Final EIS is proposing to restrict Runway 14/32 for use only during northwest or southeast winds of 10 knots or greater. In proposing this restriction, the FAA expects that the principal delay reduction benefits of the runway would be realized and that runway utilization at Logan Airport would remain consistent with recent patterns. See Section 3.8 of the Final EIS for a discussion of the wind restriction analysis and Section 4.1.2 for operational implementation of the restriction.
17.118	Noise	INM Model	The SEIDS/FEIR fails to evaluate the unique local topography at Somerville. Somerville includes seven hills. Three of these hills have steep slopes facing the aircraft flight tracks. Housing and other structures atop these hills receive greater noise than is predicted by the INM model because the ground drops away so quickly that it preludes the normal ground absorption of sound that is inherently assumed within the INM methodology.	Contrary to the opinion expressed by the commenter, terrain in Somerville has no material effect on the noise levels predicted for that area. Most departures off of Runway 33L are more than 3,000 feet in the air and climbing when they pass over Somerville. The maximum elevation of the hills is on the order of 100 to 130 feet. In the case of a slow-climbing aircraft flying directly over one of these hills in Somerville, the effect of terrain elevation would be a few tenths of a decibel. The effect is even smaller for the more typical conditions in this area. In addition, the INM methodology for addressing ground absorption applies when an aircraft is close to the horizon; the ground effect decreases to zero for aircraft high in the air as is the case for most traffic climbing out over Somerville. Thus, terrain effects in

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				this area are insignificant. They do not affect the fact that the Day-Night Sound Level values in Somerville are well below 60 dB, both now and in all future scenarios examined in this EIS process.
17.119	Alternatives	New Airport	Massport says that to be a world-class city Boston requires a growing downtown airport. As the chart below shows clearly, most world-class cities choose to put the airport at a distance, where it is less disruptive. The average distance for the list below is more than 24 kilometers, and the median is more than 22 kilometers. In fact, any attempt to grow its downtown airport would put Boston seriously out of step with the usual practice of world-class cities, which has been to supplement and replace close-in airports, not to grow them.	The purpose of the Airside Project is to ensure that Boston has an efficient, rather than an inefficient, airport to meet its air travel and commerce needs. FAA supports the goal of investing in existing airport infrastructure to enhance the efficiency Logan Airport and the national aviation system. The list of world-class cities cited in the comment excludes several world-class cities with close-in airports such as New York (LaGuardia Airport is 6km from the city center), Los Angeles (LAX is 14km from the city center), Washington DC (Reagan National is 5km miles from the city center), and San Diego (Lindbergh Field is 3km miles from the city center). In regards to a developing another airport further from downtown Boston, the Second Major Airport Study, conducted in 1991, identified three potential second airport sites for further review. The study also noted the existence of strong community oppositionn to new airport development and identified that a 10 to 15 year timeframe would be required for site selection and environmental review in addition to a multi-year construction period. Hence, development of a second major airport would do nothing to reduce existing delays or delays expected over the next 10 to 15 years.

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17.120	Alternatives	PPP vs. 14/32	Fixing Logan delay: 2 methods. Build Runway 14/32 vs. Regionalize and manage demand: 1) How reliable is the method? Building a short runway to reduce delays has been tried, and has failed, at Philadelphia and at Baltimore….The Short runway cannot be used by the regional jets ….In the 1980s demand management at Logan reduced delays …and can work today. 2) When will delay reduction benefits become available? [If Runway 14/32 is built] Maybe never…..As soon as a demand management method has been approved, it can be implemented….Demand management is a much quicker solution. 3) How long will delay reduction benefits continue? At best, Runway 14/32 is a short-term fix….. 4) What is the cost? Massport has been vague about the cost of Runway 14/32. 5) Who pays? [If Runway 14/32 is built] Each member of the traveling public pays in two ways: increased landing fees to offset capital expenditures; and by enduring delay. [With demand management] Travelers who choose to travel at peak travel periods pay ticket surcharges. Others get discounts for traveling during times of lower demand. Because demand management boosts effective airport capacity competition lowers ticket prices generally. 6) What about the environment? The Runway 14/32 project is about enabling open-ended growth at Logan, regardless of the consequences for delay or for Logan's neighbors. Regionalization dilutes impacts on the living environment, sharing them more equitably and reducing the total number of affected people by moving some impacts out of the Boston area.	1) The situations at Baltimore and Philadelphia are very different from Logan, and the lack of use of 5,000 foot runways at those airports is not an indication of future use of the proposed Runway 14/32 at Logan. At Philadelphia the design of the 5,000 foot Runway 8/26 was originally intended to provide additional capacity under instrument conditions by separating jet and commuter operations. However, use of Runways 26 and 27L for arrivals creates a wake vortex dependency between the arrivals on 27L and the departures on 27R that adversely affects the jet capacity. Hence, the use of the commuter runway actually lowers the capacity of Runway 27R. In VFR conditions, Runway 26 produces little or no increase in VFR airfield capacity, and air traffic control reportedly finds it simpler to operate on the existing configuration. The remote location of Runway 8/26 requires a long and complex taxi route to the main terminal area, and the runway also has a significant down slope that increases landing distances and could restrict some aircraft from using the runway. These conditions are specific to Philadelphia and do not apply to Logan. It should also be noted that the lack of runway use is not an RJ issue. Philadelphia has significantly more turboprop operations than regional jet operations, and even these turboprops are not using Runway 8/26. The 5,000-foot Runway 15L/33R at Baltimore Washington International Airport is an extended general aviation (GA) runway located adjacent to the GA ramp. Due to the proximity of a nearby residential area, the airport has imposed strict noise limits that explicitly prohibit any use of the runway by commercial jets. This noise rule precludes regional jet use of the BWI runway. In fact, many GA jets such as Lear 35s and Citation IIs are also restricted from using the runway, as are some turboprops such as the ATR-72. Appendix C of the Supplemental DEIS/FEIR contained the FAA's independent analysis of regional jet utilization of the proposed Runway 14/32. Using the FAA's assumptions, which were confirmed by MITRE (Refer to Chapter 3 and Appendix J of the Final EIS), most of the regional jets forecast to use Logan Airport in the future are capable of landing on a 5,000 foot runway. Of the 184,000 regional jets in the 37.5M High RJ fleet, 43,000 are Dornier 328Jets, 36,000 are CRJs, and 100,000 are Embraer 135/145s. The remaining regional jets are larger 70-seat models that were assumed to be incapable of landing on Runway 32. Assuming that the Dornier 328 Jets could land under any conditions and that the Embraers could land under dry conditions (which occur 88 percent of the time), approximately 131,000 regional jets, or 71 percent of the future regional jet, are able to land on Runway 32. This constitutes most of the regional jets forecasts to use Logan Airport in the future. Using those same assumptions, approximately 79 percent of Logan Airport's recent regional jet operations (June 2001) could land on Runway 32. Refer to Section 3.3 of this Final EIS for a complete discussion of the utilization of Runway 14/32 by regional jets. The PACE peak pricing program was only in effect at Logan Airport for 6 months from July to December 1988. Although operations and delays at Logan Airport may have declined during these months, there are several factors other than PACE that influenced this observed trend. While general aviation activity declined at Logan Airport during the 6-month period, other Boston area facilities (i.e., Hanscom, Beverly, and Norwood airports) experienced similar declines, suggesting that other economic factors were responsible. If PACE truly affected Logan Airport's GA users, one would reasonably expect an increase in GA activity at the reliever airports. Furthermore, GA at Logan Airport continued to decline annually from 1988 through 1995, long after PACE was suspended. This downward trend in GA activity at Logan coincided with an overall decline in GA activity nationwide. Other factors explain the decline in regional carrier activity over the 6-month period that PACE was in effect. For example, two large regional carriers, Bar Harbor and Provincetown-Boston Airlines (PBA) were merged into Texas Air

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				Corporation in June 1988. As a result of the merger, the combined operations of these two carriers was reduced by more than 25 percent. The reduction in activity reflected a corporate decision to use the former Bar Harbor assets to provide feeder service to Continental Airlines' growing Newark connecting hub. Four other regional carriers - Business Express, Ransome, Valley, and Command - actually increased operations at Logan Airport during the period that PACE was in effect. 2) As soon as it is constructed, Runway 14/32 will produce immediate delay reduction benefits by maintaining Logan Airport's normal operating capacity in northwest wind conditions. Implementation of a peak period pricing program requires a rulemaking process and public participation. Additionally, any peak period pricing program introduced in the U.S. is likely to be subjected to lengthy court challenges from the airlines. Other demand management programs that restrict access to the airport would be subject to the FAA's Part 161 process. Compliance with the FAR Part 161 process has proven difficult for airports because of the demanding legal requirements that must be satisfied for approval of mandatory access restrictions. The Part 161 process also requires that all reasonable alternatives to mandatory access restrictions be implemented first. To date, no airport has been able to obtain approval for Part 161 mandatory access restrictions. Furthermore, peak period pricing and demand management are not substitutes for the runway proposal. Only Runway 14/32 addresses the wind related VFR delays that currently plague the airport. 3) Runway 14/32 produces immediate and long-term benefits by lowering runway delays by 38,000 hours under 1998 conditions, and by as much as 94,000 hours in the future 37.5M High Fleet scenario. The sooner airside efficiencies are implemented, the more benefits will accrue over time. Greater use of regional airports is also necessary for accommodating long-term growth in the region's air travel demand, but will not resolve Logan Airport delays that occur during northwest winds. 4) Updated costs for construction of Runway 14/32 are presented in Section 2.3.5 of this Final EIS. While the airport may not incur any significant costs due to implementation of Peak Period Pricing, the increased landing fee revenues described are increased costs to both airlines and passengers. In addition, there could be additional costs associated with demand management options such as reduced access to the national air transportation system for small communities. 5) The Airside analysis indicates that Logan air passengers will endure fewer delays if Runway 14/32 is built. By reducing airside delays, Runway 14/32 will reduce the cost of delays incurred by travelers. Travelers choosing to fly during periods of peak demand already pay higher ticket prices than passengers who can travel during off-peak times. Since a peak period surcharge increases an airlines operating costs, it is unlikely to result in lower ticket prices overall. It is also unclear how Runway 14/32 could lead to more expensive tickets while demand management would boost effective airport capacity and increase competition. If anything, demand management practices would reduce competition by limiting the number of choices available during peak periods while simultaneously increasing the costs associated with those choices. 6) Runway 14/32 does not increase Logan's typical operating capacity, and it will not encourage additional growth at Logan (see Section 3.7 of this Final EIS). In addition, Runway 14/32 provides clear environmental benefits by reducing the number of people within the highest 75 and 70 dB DNL contours and shifting flights to overwater flight paths. Both Massport and FAA

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				encourage increased use of the regional airports, but it is not clear that increased use of the regional airports would reduce the total number of affected people or reduce overall environmental impact sources.
17.121	Runway 14/32	Runway Use	Comment references Chart " Total Jet Flights Affecting Communities Before & After Runway 14/32*"	The referenced exhibit is misleading as it compares 1999 operations to the Preferred Alternative under the 2015 High RJ scenario. As total jet operations in 1999 are 301,900 while total jet operations in the 2015 37.5M High RJ fleet are 505,800, there will obviously be increased jet overflights over many communities. The correct comparison is the Preferred Alternative versus the No Action Alternative. The Preferred Alternative decreases operations to the North and South and increases overflights to the East (over water) and to the West relative to the No Action Alternative. This results in a more equitable distribution of noise and provides controllers the opportunity to better achieve the PRAS goals compared to the No Action alternative. As far as the note regarding East Boston, Chelsea, Everett, and Somerville, the analysis did not omit the Runways 32/27/33 configuration. As shown in Appendix H of the Draft EIS/EIR and Appendix D of this Final EIS, this configuration was analyzed and was included in all Runway 14/32 analysis scenarios. Furthermore, there is no reason to expect this configuration to become the preferred high-capacity configuration, as it has a lower capacity than the Arr 4L/R - Dep 4L/R & 9, the Arr 22L&27 - Dep 22L/R, and the Arr 33L&32 - Dep 33L&27 configurations.
17.122	Noise	Modeling	The comment refers to Figure ES-6 of the SDEIS/FEIR, and suggests that inaccurate flight tracks from the INM were used to model jet approach paths to Runway 33L.	While the figure with the Runway 33L flight tracks is an edited version of Figure ES-6, Figures 5.2-2 and 6.2-1 of the Supplemental DEIS/FEIR show the Runway 33L arrival tracks more clearly. None of these figures depict the actual radar tracks that were used to determine the modeled flight tracks, nor do they show the actual INM tracks used in the modeling. They show representative flight corridors flown in and out of Logan and they are intended to illustrate the breadth of coverage of the radar data, including overflights of Hull. In fact, the graphic accompanying the comment (the edited version of Figure ES-6) has selectively illustrated tracks going just west of the peninsula while Figures in the Supplemental DEIS/FEIR clearly show an additional representative flight that goes directly over the peninsula, just east of the illustration produced by in the comment letter. Actual tracks used in the noise modeling have been shown previously in other Massport publications including a number of recent Generic Environmental Impact Reports and Annual Updates produced for the Massachusetts Secretary of Environmental Affairs. Those jet and turboprop arrival tracks also go directly over the end of the Hull Peninsula, approximately over Hull High School.
17.123	Runway 14/32	Flight Tracks	Comment references picture of Hull High School. When Massport says, " Out over the water…," this is what they are talking about. Based on standard procedures for Runway 33L arrivals, the airplane shown here is separated from the students and teachers directly below it by a scant 1,500 feet of altitude, or less. That puts the airplane closer to the people in the school than the control tower at Logan is to the nearest point on any runway.	The reason this is called an over-water flight path is that aircraft approaching 33L fly over land further from the runway and at higher altitudes than operations to or from other Logan runways. The tip of the Hull peninsula is approximately 5 miles from the end of Runway 33L. In contrast, arrivals to Runways 4L/R and 22L/R fly over populated areas until they are within one mile or less of the runway ends. In addition, even with the Preferred Alternative, Hull is outside even the 60 dB DNL contour, while populated communities impacted by other runways are within the 70 and 75 dB DNL contours. The 33L flight paths were clearly presented in Figure 6.2-1 of the Supplemental DEIS/FEIR, which shows jet arrivals over the tip of the Hull peninsula at an altitude below 2,000 feet.

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Code	Topic 1	Topic 2	Comment	Response
17.124	Noise	Discrepancies	Massport's Noise Contours are Inaccurate and Deceptive. Unexplained gaps in Massport's noise contours, such as those seen in enlargement at left, are indicative of non-standard methods used in their production or presentation. ...Graphical Integrated Noise Model output is performed using a program called NM Plot. This program was developed by the U.S. Air Force and is used by the DOD and most of DOT to draw noise contours. Discussions with the program developer (Fred Wasmer, private communication) indicate that the INM output for any single noise contour (e.g. DNL 65) is a single set of vector points forming a closed polygon. That is, each noise contour is internally represented in the computer as a single mathematical object, and is individually selectable in its entirety with the mouse by using a single mouse click. The PDF files supplied by Massport on the CD ROM version of the Supplemental DEIS/FEIR contain noise contours which are not single closed polygons. Several of the contours, instead of being contours, are really two separate curved line segments. Those contours as presented by Massport could not be the direct computer output from NM Plot. If they ever were NM Plot output, then they have been edited in some fashion or otherwise altered.	As stated in the comment, the INM normally produces a continuous thin line for the contours it calculates, but it also shows runways as equally thin lines. Furthermore, the model has no other map-producing capability to show community boundaries, land uses, roadways, shorelines, airport boundaries, or other map features. Thus, informative presentation of noise contours always requires transferring the contour plot to a useful basemap. This transfer process is a standard procedure, and it is this transfer process that results in the "unexplained gaps" in the contours. These gaps are not inaccurate and deceptive. In fact, in the Supplemental DEIS/FEIR, the transfer was done electronically to maintain integrity between the contour plots produced by the INM and the contours shown in the document. Furthermore, the Supplemental DEIS/FEIR enhanced the graphics using Geographical Information System (GIS) software, specifically in response to public demands for improved, more readable graphics than had been shown earlier in the Draft EIS/EIR.